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Author(s): Dirk H. Van Nouhuys, Elizabeth K. Michael, Raphael Rom,
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INTRODUCTION 1

This is the third and last report in a project where the product was three reports and specified programming tasks. As the first part of the project, we examined a range of technical document production processes and computer-based aids of varying character to understand what was the state of the art and what types of document production tools people need. NLS (oNLine System, the set of computer tools developed at the Augmentation Research Center) was one of several systems examined. This part of the study was reported in "Document Production and Control Systems, Phase I Report" (1) that has already received considerable circulation among people interested in this field. 1a

When the Phase I report was completed, we proceeded to develop a conceptual design of a model computer-based document production system. This conceptual design was described in the Phase II report, "A Model Document Production System" (2). The Phase II report was published recently and we hope will also be of general interest. NLS was not discussed in the Phase II report. In this third report, we compare NLS as it is generally used today to the model system described in the Phase II report. Where NLS does not provide model services, we comment on its deficiencies, briefly describe how NLS might be improved in terms of the programming work involved, and suggest very roughly what sort of effort might be involved. We believe this report will be of more narrow interest, largely restricted to people interested in NLS development. 1b

In comparing NLS to the model system, we have based our comparison wholly on the NLS system currently in use by most ARC customers, and do not include certain developments that are available in experimental versions not yet released for general use. We have also based our comparison on the needs of publications people who would use a support system only in publications work, are not interested in other applications, and have no knowledge of or interest in computer programming even at an elementary level. This strict point of view is important when we evaluate terminology. It happens that NLS has various general-purpose functions that are extremely useful in publications but have general-purpose names, e.g., it is very easy to point to and move paragraphs, but the user must refer to them as "statements." We treat such vocabulary difficulties as failure to conform to the model. 1c

In basing our comparison on the needs of publications people in a narrow sense, we impose costs for tailoring user interfaces that are not necessary or desirable for experienced NLS users. For example, we discuss in 4b4 that the NLS search commands do not include a provision for ellipsis. 1d

[By ellipsis we mean searching for words that may be interrupted by other unspecified words, e.g., "Dog...no cats" where "..." represents unknown intervening words.] 1d1

Elliptical search is omitted only from the command language. In practice, NLS users search for material, including ellipses, by writing one-line programs ([Dog"] [no cat"] in this case) which can be merged into the running version of the system with one command. To take another example, we point out that the user may not address a text entity called a "header." Nevertheless, experienced users not only can create several levels of headers with various formatting, but they can do so more easily than in most computer publications systems. 1e

Similarly, comparison with the model does not include the present cost advantage of NLS flexibility and programmability. To take one example, a current user is required to produce a wide chart for briefings (3). The content is organized hierarchically, but for the briefings it is necessary to align the highest level items in the left-hand column of an oversized sheet, the second-level items to their right, the third-level items to the right of them, and so on. Because of the modular delivery of statements to the NLS formatter, in a couple of hours it is possible to make a special program change for him to print out the items from different levels on succeeding pages to make an effective chart from a coherent online file. Now this user can view his file online as an outline and print drafts in the briefing format at any time. 1f

The work necessary to make NLS measure up to the model varies greatly in programming complexity, from trivial modifications to projects of several person-years. In the case of the larger projects, it is often very difficult to make accurate estimates of the programing time necessary because the proper method of approach has yet to be established. In some cases, the interdependence of the programming tasks make costs difficult to estimate; for example, programming to make the Output Processor a multi-pass machine will make a variety of other tasks cheaper. We were often able to draw on detailed design analyses done in the past, but in many cases estimates are the result of only a few of hours

thought. In a few complex situations, we indicate the effort required to establish reasonably sound estimates of cost rather than estimating the cost of the work itself. 1g

The reader should consider these particular problems along with the well known general difficulty of estimating the cost of systems programming. The estimates of effort given for making various changes in NLS are, in most cases, no more than rough indications of the size of the task involved, useful only for questions of policy and goal setting rather than for establishing budgets. To ensure that users have a debugged tool and orderly change, the Augmentation Research Center releases successive versions of NLS for general use only after they have been tested and debugged in experimental use. The present running version is NLS 8.5. All the future development work discussed in this report assumes implementation in NLS 9, the version now undergoing final testing. 1h

Following the Introduction, the brief central section of this report summarizes, at a high level, the work that would be necessary to make NLS conform to the model suggested in the previous report (2). It treats the character of changes necessary in NLS generally, the changes specific to the Output Processor, and the changes specific to the Graphics subsystem. In our conclusions we suggest priorities and proper work order. 1i

Finally, an appendix which forms the bulk of this document compares NLS point by point to the ranked list of desirable features in Appendix II of the Phase II report (2). The Appendix describes how necessary changes might be made in NLS and gives rough estimates of the programming time involved in making them. It is organized to match Appendix II of the Phase II report. Although, in a sense, this material is the meat of this report, we have placed it in the Appendix because its technical detail and its arrangement to match Appendix II of the Phase II report make it rough reading for anyone without a specialized interest. We hope that the following section, General Considerations, will fill the needs of the reader who is not interested in implementation design or budgeting questions. 1j

The report, which contains many technical terms from publications, printing, and computer science, lacks a glossary. However we suggest the reader will find the Glossary in the Phase II report helpful. 1k

This report is necessarily highly cross-referenced. Externally, it depends closely on the work of the two earlier, more extensive, reports in the contract and on a number of NLS planning documents. External references are cited with numerals in parentheses which match in the conventional manner to citations in the References section. For convenience, the previous two reports are referred to as The Phase I report (1) and the Phase II report (2). 1l

The extensive internal referencing comes largely from the fact that the report is organized from the viewpoint of the user while it frequently discusses implementations from the viewpoint of design and programming. As a result, programming work which is discussed in one section may be cited in many other sections. Internal references are in the form of alphanumeric outline numbers, e.g., the number of this paragraph is 1f2. 1m

GENERAL CONSIDERATIONS 2

GENERAL CHARACTER OF MODIFICATIONS NECESSARY TO NLS 2a

Excluding the changes to the Output Processor and the Graphics system discussed below, changes to NLS fall into six categories. 2a1

Distributed Processing 2a1a

The most distressing difficulties that publications people have with NLS revolve around reliability and response time. Even though the hardware that NLS runs on has a reasonably high standard for reliability as computer systems go, the threat of a disastrous crash as a publication deadline approaches is enough to keep many people from using it or any system based on a single, distant central processor. The slow response to typing and commands often experienced during normal working hours is enough to drive some publication people crazy.

We believe that distribution of NLS functions between a mainframe and a micro-processor-based workstation with a few hundred pages of file storage and the capacity to do local editing, whether attached to the mainframe or not, will improve reliability and responsiveness substantially, see 4h3 and (15). The response of such a workstation typically approaches that of a typewriter for input and is very rapid for the commands it executes locally. The files constitute a visible backup of what the user is currently working on. In addition, such workstations contribute inexpensive offline input and file privacy; typically, you can take your file away in your briefcase when you turn off the workstation.

The Agent 2a1b

The technical documentation task in large organizations involves a continuing cycle of dissemination, retrieval, and re-exposition. We saw in our analysis in the Phase I report the importance, in terms of labor and calendar time, of distribution, communication, and housekeeping functions to the document production cycle. In the model system elaborated in the Phase II report, we postulated a control mechanism, analogous to the control mechanisms of some industrial process, which we called the Agent. Only very rudimentary functions like the Agent exist in NLS or any publications environment. NLS and its operating systems are well suited

in terms of file control, record accounting, and communications functions to support such a process control system. However, it differs in many ways from previous NLS programming and we are not able to offer a detailed implementation plan. We estimate at 4g what it would take to develop an implementation plan.

File Handling 2a1c

In general NLS, with the operating systems TENEX and TOPS-20, offers file handling that is more than adequate to support a model system; indeed, file handling is a reason to choose NLS as a starting point rather than other possible software. The file system falls short mainly in two respects, limits on file length and translation of files from other systems.

In 4b5, we discuss a proposal to increase NLS file length to the equivalent of about 3000 text pages (11).

There is no general solution to the problems of translating files from other systems. In 4a3, we discuss some ways in which NLS could handle the various problems more gracefully particularly in terms of taking instructions from the user.

Publications Concepts and Terminology 2a1d

In many cases, NLS offers effective tools that are inaccessible to new users because they are couched in unfamiliar terminology. One example is the basic unit of an NLS file which is commonly used in documents to hold a paragraph but is called a "statement." In some cases, it would be possible to define synonyms for the benefit of publication people, in others it would be easy to define familiar working units for the computer (see 4b1).

Workstations 2a1e

Publications work is handicapped by the 25 x 80 character workstations which support only a limited selection of monospaced characters. Such workstations are typical of NLS and computer display systems generally. They do not look at all like the printed pages which are the goal of publication. ARC has a history of being forced into hardware development work because commercially available equipment was inadequate to its software, and a breadboard multi-font, full-page display was constructed at ARC (8, 9). Such displays are certainly necessary for a model production system,

but commercially available hardware is beginning to catch up to users needs. We suggest here that the most effective strategy is to put our resources into the software work necessary to adapt NLS to various workstations (15). (See 4i5.)

Work Aids 2a1f

The Appendix includes a great many suggestions for small and medium scale changes that would increase the productivity of people using NLS for their work. The tools are rather heterogeneous, but a few generalizations can be made about them. In most cases, such changes would increase the productivity of anyone working in NLS; see the features described at 4j5, 4b9, and 4b4 for examples. Other features, such as The Blue Pencil Editor (4b7), are specifically intended as publications tools, although very few NLS tools other than the Output Processor are useful only for publications work.

Reference Support 2a1g

The importance of references and the referencing process to the creation of technical documents and to the effectiveness of the process control led us to uncover the value of several such tools to the publications process. The tools we believe to be of such value are automatic citation in a second file that is cited in a first file (back links, see 4a6), index files for rapid location of words in documents (see 4a4), and improvements in the NLS library catalogue system (4a7).

MODIFICATION OF THE OUTPUT PROCESSOR 2b

In this section, we will recommend how to bring the NLS Output Processor as close as possible to the model document formatter described in the Phase II report. In general, the Output Processor is a lot closer to the model document formatter than it may appear to the inexperienced NLS user. It is a sophisticated tool, and the more esoteric and complex capabilities are not immediately apparent because its human interface is currently inadequate for providing easy application of complex capabilities. However, although an improved interface would enable unsophisticated users to use standard formats and easily create simple designs, complex document design and phototypesetting are special skills. To take advantage of the entire range of Output Processor capabilities, the user needs to be experienced in document design in general as well as in NLS. 2b1

In the following analysis, we will compare the current Output Processor with the model document formatter in three areas: conceptual design, implementation and performance, and individual capabilities and commands. 2b2

Conceptual Design 2b3

Generally, the conceptual design of the Output Processor is extremely good. The user can create an attractive document to be printed on a line printer, a high-quality typewriter printer, a proportionally spaced raster printer (17), or to be typeset on one of several different phototypesetting machines. A particular advantage is that the same file used to produce camera-ready copy for publication can be easily distributed and read online--the directives for producing the format, if properly set, do not greatly interfere with readability. The capability of producing pages of mixed text and graphics is unique in systems of the size and capabilities of NLS. Currently, besides NLS, only limited stand-alone systems can work with text and graphics in a single file. 2b3a

A basic limitation of the Output Processor is that it does not truly function as a document formatter, but actually functions as a mixture of a line caster and a statement caster. 2b3b

By "a mixture of a line...and statement caster, " we mean to describe the step-by-step-operation of the Output Processor on units of text and what fraction of a document it can consider concurrently. Briefly, NLS text is filed in the form of "statements, " arbitrary units which in publications work normally contain headings or paragraphs. The user may give global instructions to the Output Processor--for example, "set all second-level statements in italics." Statements then pass from NLS files to the Output Processor one at a time.

When the Output Processor begins to format a statement, it first checks the global instructions in force to see if any apply, then it scans the statement for instructions it may contain (e.g., an instruction to skip a line before the beginning of the text). Once it is cognizant of all the instructions that apply to the text in that single statement, it begins to set the text into lines. The length of lines depends on the particular formatting instructions in force. Once a line is cast, the Output Processor cannot go back and change it or change its location on the page.

The notion of locking text into lines is inconsistent with basic NLS concepts because the length of the line depends on the output device being used and NLS is designed to use a wide variety of output devices. This inconsistency often creates confusion for the user, who may make incorrect assumptions about the effect of particular directives. 2b3c

Furthermore, proper footnoting, automatic page cross-referencing, and a variety of other features are difficult because the Output Processor has no idea of the page location of any item except the statement it is currently processing. Processors that work in this way are called one-pass processors. If the Output Processor could pass over a document and record the information necessary for complete document formatting, it would be more effective. It could then, for example, locate and store the location of headings on pages for generation of tables of contents or store the location of words tagged for index on pages to generate paged indexes. 2b3d

Such an operation (multiple-pass processing) is conceptually similar to the analysis the Output Processor now makes of each statement, but requires considerably more complex programming and record keeping. Note that design of a multiple-pass processor must carefully consider instances when either the Output Processor or the NLS routines that pass statements to the Output Processor have changed the text after the first pass. Because of these complexities, it is difficult to estimate closely the effort required to implement multiple-pass processing. It would certainly be more than one and less than three person-years. About a month's study would be necessary to make a narrower estimate. 2b3e

The current Output Processor formats individual files rather than documents. Because NLS files are limited in size, a document may consist of two or even more files. This limitation is not a function of the Output Processor, which will accept any number of statements and create printed output for sequential files of any reasonable length (thousands of pages). It is possible to supply statements to the Output Processor from any number of consecutive or mixed NLS files with the NLS Include facility (see 4b9a). 2b3f

A general solution for all NLS files has been proposed that would allow files up to a length equivalent to about 3000 typed pages of text (see 4b5b). This involves using what in the present operating systems are called "Long Files." For various reasons, a user may want to print material from sev-

eral files in one run. If the Output Processor were a multi-pass device, as discussed above, then the capability to print from more than one file would be trivial (less than 1 person-month). 2b3g

Implementation and Performance 2b4

Several important changes should be made to the Output Processor. Processing should optionally be done in batch because it does not require interaction with the user. In the batch mode, a user would easily be able to command the system to format a file and then continue other work. The system would notify the user when the formatting was complete. Carefully programmed software to support batch operation of the Output Processor would take about 3 person-months. A version that would appear workable to the user could be made in about 1 person-month, but it will probably require eventual revision when changes are made in NLS, the Output Processor, or the operating system. 2b4a

The Output Processor program should be modularized and redundant code should be identified and eliminated. Proper modular organization will make the the Output Processor more efficient and speed up the interface between the Output Processor and NLS. Rewriting the present code in properly modular form would take about 3 person-months, but it would be more advisable to do it as part of implementing the multi-pass version discussed above since it would be part of that work anyway. 2b4b

Formatting instructions (directives) should allow the specification of conditionals as well as variables. This would enable the user to specify, for example, "if the statement that includes this directive falls on an even-numbered page, turn off the header." Implementing IF statements in Output Processor directives (but not loops) would require about 1 person-month. 2b4c

The user should be able to choose that a directive or group of directives take effect only for a particular paragraph or section of a document. After the specified paragraph or section, the directives would be reset as they were prior to the last change. The user should also have the option of easily resetting the directives in a document back to a default format. Giving the user these options involves making the Output Processor into what is technically know as a "stack machine" and would require about 3 person-months. 2b4d

Footnotes, special type elements (e.g., math symbols and

Greek letters), and white space should be included as Output Processor entities that can be controlled and addressed. The automatic generation of indexes, tables of contents, and lists of changes (including deletions) should be provided. Underlining is currently available only for phototypeset material--this capability should be extended for text printed on a line printer or typewriter terminal. A system to set basic special characters, including the Greek alphabet and common mathematical symbols, would take about 4 person-months (12). See 4d1 in Appendix I for a discussion of implementation costs for the bibliographic aids discussed here. 2b4e

The Output Processor's capabilities for integrating graphics and text need improvement and refinement to become more effective and easier to use. One important change would be to allow the inclusion of graphics by specifying links rather than the current method of specifying the acquisition numbers of statements (SIDs). Not only is the use of SIDs risky because the numbers may be inadvertently changed, but it limits the user to a graphics entities within the file that is being processed. The capability to overlay text and graphics on same page would also be a valuable addition. 2b4f

Implementation of the features depends on the manner of implementation of changes discussed in Graphics below. A person-month of study as part of the planning effort to revise graphics would enable us to estimate closely the cost of these features. 2b4g

MODIFICATION OF THE GRAPHICS FUNCTIONS 2c

The current NLS Graphics subsystem is the seed of a model graphics system. Its fundamental design, given the NLS system, is basically good. We have proved the ability to incorporate graphics into the NLS world and demonstrated the power for formatting a mixture of text and graphics. With further development, Graphics has the potential to grow into a much more powerful system. 2c1

Some commercial systems have more extensive capabilities than NLS Graphics, but those systems are dedicated. They are designed primarily for graphics, with limited integrated editing and file control capabilities and no communication facilities. To our knowledge, there is no other document production system that has more than primitive graphical facilities and that is as broad as NLS. However, many important features have not yet been implemented, the user inter-

face needs to be carefully reevaluated, and certain design changes would make the system more flexible and efficient. The following sections describe changes for improving the current NLS Graphics subsystem, including changes in system design, the expansion of existing capabilities, and the addition of new capabilities. 2c2

In general, it is very difficult to estimate the cost in person-time necessary to implement the changes in the Graphics subsystem that we recommend here. Many of the individual capabilities are interdependent; the implementation of one feature will affect the implementation of another. To create a more effective system, in-depth research, beyond the scope of this report, is necessary to design a careful implementation plan. 2c3

Design Changes 2c4

The Graphics subsystem should be capable of displaying information that is not written in a file in a manner analogous to the NLS Show commands. Show commands display information at the user's terminal, but the information is not stored. Although non-stored display would not be necessary for the creation of graphics diagrams, it would be useful for the one-time display of graphical information. The capability to display information not written in a file, for example, would allow a user who does not have write access on a particular machine to create a graphical representation of statistical data that is written in a file. 2c4a

Graphical pointers, equivalent to the text pointers in NLS, would make it easier to write application programs and would enable the use of the graphics capability from outside of the subsystem. The information to point to graphical entities currently exists, but it is not compacted enough to use. The Graphics code itself must be modularized so it will be more efficient, redundant code can be eliminated, and other tools can use graphics from within the "backend" portion of the NLS software. (See 4h3a.) 2c4b

Improving Existing Capabilities 2c5

The Template 2c5a

The template mechanism that currently exists in NLS is incomplete. Primitives such as lines, triangles, rectangles, circles, and arrowheads exist and can be addressed by name. Once a figure is created, it can be copied or moved. Figures cannot, however, be addressed

except by pointing; no graphic equivalent exists to an NLS link (see 4a1a). That is, a user cannot write out the location of an NLS diagram as an item of text and command the machine to load and display that diagram.

Implementing graphical links will cause a coordinate-addressing problem. Currently, a figure is addressed by a cursor so the user will not have to count coordinates. If links are desired, the coordinate position of the figure within a diagram must be specified. The ability to name figures is valuable and relatively cheap to implement. Two types exist: temporary (invalid across sessions) and permanent (definitions are remembered across sessions). The permanent names could be implemented with a template file that contains one NLS statement per figure and has a name associated with every statement. The user would copy figures by specifying a link, with the file and statement names, to the statement that contains the template. For temporary names, the system would create a temporary file, simulating the permanent mode. A scaling capability would allow the use to enlarge or reduce the figure as he chose.

Erasing 2c5b

Erasing now exists in the form of commands to delete a line, a group of lines, or a figure and to backspace over an extension to a line. The performance of these commands needs improvement. A Break Figure command, to separate a figure into identifiable parts, should be implemented. This feature could easily be implemented for figures created by the Xtend or Append commands. Implementation for figures created by the system (e.g., circle or triangle) is more costly but extremely valuable. It would also be extremely useful to be able to change part of a line to be invisible, rather than breaking the figure and erasing.

New Capabilities 2c6

Free-hand Drawing 2c6a

The implementation of a free-hand drawing capability will require the introduction of a new input mechanism, as well as an expensive output (display) device. With the current data structures in the Graphics system, a simple hand-drawn line may saturate the system. New data structures to compress data must be introduced. Algorithms for data compression/expansion have already been invented, but

still need to be implemented. Because few NLS users require hand-drawn graphics, this capability is not recommended for priority implementation.

The possibility of a useful and economic intermediate step exists. It would be possible to build a "rubber band" drawing capability on the basis of adding commands to the existing software. Rubber band drawing would allow the user to create complex geometric figures in a single command by tagging a series of points with a cursor. The figure could then be copied, moved, and so on like any other figure. A drawing function of this type could be implemented in one person-month.

Color 2c6b

In terms of NLS software, this feature will be easy to implement. It requires attaching a new property to graphical entities, the color. Commands will have to be devised to output each color separately. The cost of the implementation is dependent on whether introducing new properties for graphics entities will require changes to the graphics file system. A minimum estimate of implementation time is 3 person-weeks.

The devices that portray color vary however and some amount of programing time, impossible to predict closely without knowing the devices, will be necessary to implement display of color properties on each device.

Blowing up and Cropping 2c6c

Scaling figures should be easy to perform. This feature must be implemented if the template capability is implemented. Cropping will be much harder to perform. It will require some carefully designed data structures and algorithms, based, for example, on those developed by Warnock at Utah (20). If the mechanism to "break figures" is implemented, the addition of cropping will take approximately 3 person-weeks.

Texture and Background 2c6d

Background may be stored in the NLS Graphics system as a series of lines where the end points are within some geometric shape. The resulting figures will require a larger amount of storage space than same geometrical shapes as line drawings, but they will not require a special kind of storage or graphics entity. In terms of out-

put, we have to make sure background does not obscure the rest of the diagram. We will need to distinguish texture and background from the diagram itself on the display--this may not be possible on the Tektronix 4014.

Illustrations Filters 2c6e

A filtering capability would allow selective viewing of graphics illustrations through the equivalent of NLS viewspecs. The user could view a single graphics entity or any combination of entities, specifying colors, types of figures, and so on. The implementation of this feature is possible, but it is dependent on making certain design changes, including the creation of the new display mechanism described under Design Changes above. We recommend that the implementation of this feature be given a high priority.

Text Editing 2c6f

The full range of NLS editing commands should be available for modifying text within illustrations. The implementation of this capability would be easy--perhaps 1 person-month--because graphics text and regular text are stored the same way.

Dynamic Flowcharting Subsystem 2c6g

By dynamic flowcharting we mean being able to insert an element in a flow chart and have the rest of the network adjust topologically to include it. For example, someone could modify a PERT chart by entering an additional circle and the system would spread the line to accept it and make any other necessary adjustments.

A separate subsystem is required for the dynamic flowcharting capabilities described in the Phase Two report, because the necessary data structures are complicated. The algorithms already exist and are not extremely complicated. This subsystem is required only when flowcharting (of complex charts) is performed relatively often.

CONCLUSIONS

In the Phase I report (1), we concluded from our study of several technical document production cycles and computer-based aids to document production that good progress has been made in typesetting and reducing the amount of retyping in production work, but opportunities for marked improvement are to be found in formatting, production control, and draft generation and approval.

In the Phase II report (2), we attempted to understand analytically the general need of technical document production as a continuing process and outline the reasonable possibilities for computer support in a way that was both detailed and integrated.

One outcome of our comparison of NLS to the model system described in the Phase II report was the recognition that in certain important respects NLS is an outstanding system for producing technical documentation. NLS's greatest strengths lie in certain features (though no features are without shortcomings). The strongest features are: the file system, communication functions, the formatter, a wide range of editing commands, and the presence of graphic functions. A special word should be said about integration. The importance of integration to future evolution of document production is discussed at some length in the conclusion of the Phase II report. No other system even attempts to cover the complete production cycle as described in Phase II report. Not only does this integration improve the existing work flow in many cases, it gives a better base on which to develop future tools.

A second outcome was the conclusion that NLS was deficient in several important respects. The most critical, as has been recognized for some time, is economical responsiveness at the workstation. Reliability, printing of special characters, full-page display portrayal, use of publications terminology, and tools for the user to easily and coherently control the Output Processor are other important areas where development work must take place to bring NLS to a par with the good systems that exist in various publications domains.

Finally, we recognize that opportunities exist in NLS to build up functions to approach the model in ways well beyond those of existing systems. Those opportunities exist first of all in the development of the process control facilities we have called the Agent. It will also be extremely valuable to carry forward the integration of graphics with text,

and to extend the user interface of the Output Processor into a handy design and layout tool and to increase its range of action from a line caster to a document formatter. 3e

APPENDIX I:
DETAILED COMPARISON OF NLS TO THE MODEL DOCUMENT PRODUCTION SYSTEM WITH NOTES ON IMPLEMENTATION AND COST 4

INFORMATION GATHERING AND WRITING 4a

Links. 4a1

Status in Existing NLS 4a1a

The "link" feature discussed in the Phase II report is the capacity to write the computer location of some document or part of a document into user text for purposes of instant online and offline referencing. Links exist in NLS as described in (29000,3e2d1), and the parenthetical expression just shown is an example of one. Online, a user would be able to point to it and then see displayed the appropriate passage of the previous report. This feature, which allows the user to reach out to a specific character in another document, is extremely useful in many publication tasks. It would be much more powerful if back links (discussed below) were implemented to form a complete cross referencing system.

Type-in Mode 4a2

Status in Existing NLS 4a2a

Response that allows a production typist to work in a normal way is not available in NLS when it is operating through the ARPA Network in the manner it is most commonly used. It is available under certain special circumstances.

It is available to typists working through a connection to a mainframe of 4800 baud or more in DNLS, and 300 baud or more in TNLS, only when they have a prohibitively expensive allocation of machine power. The share necessary depends on the machine configuration involved, what the other users are doing, etc., but is an allocation that costs in the neighborhood of $3000 a month at current prices.

Alternatively, good response is available through typing on some offline medium that is read later into the central computer. One such medium is the Deferred Execution System developed at the Augmenta-

tion Research Center. That system is not widely used, as discussed below in 4h9a. A few users have assembled workstations based on intelligent terminals and recording media such as diskettes where they can type in text rapidly and later read it online. Such workstations essentially represent a special case of the problem of input from other systems discussed immediately below (4a3).

Analysis of Implementation 4a2b

Discussed under System Response and Reliability.

Conversion and Input of Material from Other Systems, Including Data Processing 4a3

Status in Existing NLS 4a3a

Data can be converted from other systems to NLS with little difficulty or with great difficulty depending on the source. NLS procedures handle standard TENEX/TOPS-20 sequential files gracefully. Special programs have been written to accept input from some common sources such as the SPL Graphics language or text from certain word processing devices. However, there has not been the sort of organized effort to open NLS to input from other systems that, say, Omnitext enjoys.

Analysis of Implementation 4a3b

Two steps are required to move information from an external source into an NLS file. The first step involves moving the data into a standard ASCII sequential file on the NLS (TENEX/Tops-20) computer. The second step involves converting this line-oriented sequential file into a paragraph-oriented hierarchical NLS file.

Recently developed utilities are adequate tools for doing the first step. Unfortunately, there is no good general purpose procedure for translating the sequential file into an NLS file. The Copy Sequential command in NLS makes its own assumptions about the format of the sequential file, and the resulting NLS files usually require substantial hand editing.

A Copy Sequential command is needed which can take

parameters from the user that describe the format of the sequential file. The parameters could be given either through interactive dialogue or by specifying a simple language through which the user can guide the translation process. The kinds of parameters needed for a general purpose algorithm are:

How is a new paragraph indicated?

How is hierarchy indicated?

None

By indentation

By paragraph numbers

Should leading/trailing spaces be deleted from each line?

Should line ending carriage returns be deleted (NLS automatically formats line length within a paragraph)?

Implementation Cost 4a3c

One to two person-months effort.

Keyword Filters 4a4

Status in Existing NLS 4a4a

We belive "keyword" mechanisms would support publications functions in several important ways. However we must straighten out some problems of terminlogy before we can discuss them clearly. "Keywords" is used in the Phase II report in the generally familiar sense of a word that is entered on a library card, or something functioning like a library card, for the purpose of identifying a whole document by its contents. Keyword functions, in this sense, exist in NLS in connection with the catalogue function of the Sendmail Subsystem. The automated production control system (the "Agent" described in the Phase II report) would make use of keyword functions in the library sense, and the facilities that exist in the Sendmail Subsystem will be adequate at least if volume is below a certain size (say 10 documents a day).

A general facility should be available for both attaching keywords to statements (whether or not the keyword appears in the statement) and for building inversions of the file based on these keywords to allow rapid access to the keyworded text.

NLS has limited automatic keyword facilities using the NLS statement name feature. The keyword must be the first word in a statement and only one keyword per statement is allowed. All NLS files are automatically inverted on statement names. This allows rapid searching through files whenever statement names can be used.

In the second sense, a "keyword" means a word in a complete document that has been tagged in a way so that the computer system can locate it quickly. A Keyword facility in this sense can be used, for example, to identify words that will appear in the index of a document, or locate, online, the parts of a document that deal with a certain subject without going through the time consuming process of having the computer scan every character of text.

Tagging of keywords could be implemented in two ways: (1) by an extension of the present statement name mechanism to NLS file property lists and (2) by establishing a separate file associated with the document. There are advantages in each implementation and both should be considered.

Implementation I: Keywords and Properties

The NLS file system allows attaching properties to statements. A property consists of a flag that indicates the existence/absence of the property and possibly a data block that holds some property-associated data. For example, a property flag can indicate that the attached statement is a header (no additional data necessary), or the flag may indicate that this statement has keywords associated with it and the data block will hold the keywords in some coded form. Some examples of properties now in use in NLS are statement signatures (always existent), statement names, and graphic properties.

Implementation of user accessible properties in-

volves two stages: implementing the property in the file system and providing a user interface. Properties, as explained above, are inherent to the NLS file system and consequently introduction of additional properties will not require an extensive effort. Adding data blocks to the basic statement structure poses no implementation problems. However, the effect of adding large blocks of data on NLS file size must be considered.

The cost of providing user access to properties depends upon the nature of the access required. Some kinds of access the user may need are:

Assign property to statement

Remove property from statement

Show property of statement

Show all properties of statement

Jump to first/next statement containing property

Directives in the Output Processor that recognize the property

Content analyzer primitives to refer to properties

Viewspecs for property portrayal control

A facility should be provided for indexing (inverting) the file on keywords. This could probably be done by using the same algorithms that statement names now use. Some modification of the file system would be required to allow for a variable number of keywords per statement. This implementation would make the access methods listed above fairly easy to implement because it would follow the statement name pattern.

Implementation II: Separate Keyword Files

Proposed Design

A new type of file, a keyword file, is proposed. This file would have, for each keyword, a list

of the statements to which this keyword has been assigned. These statements may occur in arbitrary NLS files. The keyword files will be maintained and searched through with new NLS commands dealing with keywords.

Ultimately, we believe keywords should be implemented in both ways. The benefits to the user are somewhat different: The implementation based on property lists will run faster and require somewhat less programming. The implementation based on separate files allows the indices of different files to be pooled easily for output, for example, to index documents that are made up of more than one computer file and to create subset files.

Keywords can be associated with statements.

There are several ways in which keywords can be associated with statements. The easiest way, in terms of development costs, is to have the user manually (interactively) make the association. Thus the user has a command which says something like:

Associate Keyword "Whatever" with Statement such and such

It is also possible, although much more difficult, to develop an algorithm which will automatically assign keywords to statements by scanning, and analyzing the text of the statement. The difficulty here is to tune the algorithm properly to avoid the common problems of defining either too few or too many keywords for each statement. Much time in the field of computer science has been spent on this problem with very few positive results. We, therefore, recommend against attempting this task.

A combination of a manual and automatic operation is possible wherein the computer interacts with the user to specify the keywords for a statement. The approach is feasible, but requires additional design effort.

Searching Keyword Files

The minimal requirement for searching keyword files is to find all occurrences of a given keyword from a single keyword file. The next level of capabilities is to find those statements which satisfy a criteria defined in terms of keywords and boolean operators, for example:

> Find Statements with keywords ("Algorithm" OR "Formula") AND ("Fortran" OR "Algol")

The next level of effort would allow the user to create and manipulate subsets of the keyword file. Thus, the user can specify one criterion and save the returned pointers as a set. The user could then perform set operations on these sets, or upon one set and a search criterion.

Another level of effort would allow the user to define the set of keyword files which are to be included in his searches. These files would be combined together with the set operations of union and intersection.

Maintaining Keyword Files

There are several choices as to when and how to update the keyword files. They can be updated at keyword specification time, at source file update time, or periodically as a background job. The relative advantages of these methods need further investigation.

Mechanisms for deleting keywords from a keyword file and for disassociating a keyword from a statement need specification. We must also design mechanisms for automatically updating a keyword file when a source statement is edited and/or deleted.

Implementation Cost

Three to five person-months for keywords as

properties; five to nine person-months for a separate keyword file depending upon the sophistication of the system(4).

Text Entity Filters (e.g., show all footnotes) 4a5

Status in Existing NLS 4a5a

Text entities cannot be the objects of searches as described in (29000,3b1a) and (29000,3f2c). You may search for a specific word (i.e., a command to display the next paragraph with the word "Data") but not the next place in the document that contains a word. Under no circumstances can you ask to see the next Heading, Paragraph, Footnote, etc.

Analysis of Implementation 4a5b

Requires small changes in the command language. The main task is figuring out what terminology will be most effective.

Implementation Cost 4a5c

Three person months. 4a5d

Back Links 4a6

Status in Existing NLS 4a6a

Back links occur when a new document cites an old document and the system writes a reference into the old document to point forward to the new document. No back link facilities as described in (29000,3e2d2,) now exist in NLS.

Analysis of Implementation 4a6b

Links, as described in 4a1 above, work fine as long as the material being cited has a static location. However, it is often the case, especially when in the process of building or maintaining a dynamic document, that what is cited gets deleted, moved, or changed. Currently, when an editor modifies the destination of a reference, (s)he has no way of knowing it.

An editing system is specified below which will notify the writer when (s)he tries to change the destination

of a reference. In addition, this editing system, if asked, displays the source paragraph of all the references and allows the author to update them. It sends messages to referring authors to indicate that something referred to was changed. Finally, when asked, this system, to the extent possible, goes to all of the references to automatically update them to reflect the change being made at the destination.

There exists in current NLS an "Insert Link" command which does some checking of what is inserted to verify the syntax. This command should be augmented to do the following:

(1) Check for write access to current file.

(2) Check the validity of the source link being inserted (to see if there is something at the address to which it points).

(3) Place a link at the reference which points back to the location at which the source link is being inserted (a back link).

(4) Insert the source link at the location. It should mark the source link as having a back link. This is for updating the back link when changing the location of the source work. It is also needed for knowing when to modify a back link in response to modifications of the source link.

Authors will want to allow other authors to refer to their works (place back links) without relinquishing any of their other write access. This will require that the editor have the ability to modify files designated as available for writing back links. The only thing that can be modified are back links via the editing functions mentioned above.

A new command "Insert Back link" takes as its argument the address of an existing link and then does the same thing as the "Insert Link" command.

If an edit is made to a string (such as a word or group of words) within a statement (such as a title or paragraph) that has a back link, a "back link(s)" mes-

sage will appear. If the editor does not have write access to the source reference, the author of the source link is notified that a change has been made.

A new command: "Display back link in structure at ..." shows all the places that refer to the structure specified. They are stored with the most recent first. Ordinarily, these are not visible. In order to make them invisible, the comment facility described below is necessary.

If a link is modified to point to a new place, the back link is "moved" to the new destination. The various editing functions should check for source links and back links in text that any user may want to modify and take various appropriate actions.

In order to make the system friendly for a group of authors writing and altering their files concurrently (and to provide other valuable notification services), the following would have to be done:

"Allow Citing (automatically)" command

For authors who wish to make their works citable by others. The default for a published article would be to allow automatic citation maintenance.

Automatically send message to authors or the Agent when cited material changes (allowing a time specification for when the change will take effect)

Implementation Cost 4a6c

Nine person-months [see (5) for details].

Catalogs 4a7

Status in Existing NLS 4a7a

A cataloguing system exists in NLS that offers all the normal bibliographic services, and an unusual range of capabilities to sort references by various bibliographic attributes and reformat them. It may be applied to both on- and offline documents. It would support the Agent in a relatively small operation (say

a publication group of 6-12 people), but it works rather slowly, has an awkward production cycle, and has limitations on file size that hampers the user in searching.

Analysis of Implementation 4a7b

The search techniques required by the present catalogue system would be improved by the implementation of an entity that spanned files. That implementation is discussed under 'No Computer Boundaries For Commands,' 4b5 below. Present catalogues cover periods of 6 months only, and must be expanded and sorted to allow title word, author, and similar searches over spans of years.

Rationalization of essentially the present catalogue system based on the use of larger entities and perhaps new properties (see 4a4 above) might improve speed and reliability by 5-10 times and allow the modified system to serve proportionally larger groups. Beyond that, larger scale catalogue systems would probably be best obtained by writing an NLS interface to some existing large-scale cataloguing system.

Implementation Cost 4a7c

It is difficult to assess at this point the exact usefulness of longer files and expanded properties to the cataloguing system. We may guess that implementation would take in the neighborhood of one-half to one person-year and that one person-month of design would allow us to specify the effort required more exactly. The task of writing an interface to an existing cataloguing system is also hard to specify without knowing what system and what machine(s) would be involved. However, the facility of writing such interfaces in NLS (6) might well mean that it was a shorter task than making a smaller improvement in the present system. Survey of the systems available at a given future time would be necessary to make this tradeoff, about one person-month.

Commands for Inputting Tables 4a8

Status in Existing NLS 4a8a

A prototype system in NLS exists for creating and

editing tables. It has proved very useful and popular because creating and revising tables on manual typewriters, and on systems modeled after manual typewriters, is so fantastically awkward. Anything really oriented toward creating matrix formats in a flowing way and editing rows and columns helps a lot. However, the present NLS tool has many imperfections in terms of integration of the command functions, missing features, and sound internal architecture.

Analysis of Implementation 4a8b

The existing table system should be rewritten completely, keeping the general design and very useful functions. Arithmetic calculations should be internally consistent and proper rounding techniques followed. The system should take advantage of NLS structure to display Total lines and Subtotals and should have a more sophisticated mechanism for computing both. It should allow cells to be single statements rather than rows only. Scrolling left and right, discussed in 4j1 below, would be very valuable in working with tables.

Implementation Cost 4a8c

Two to four person-months, assuming separate implementations of scrolling.

OCR Device 4a9

Status in Existing NLS 4a9a

OCR devices translate characters written on paper into a file in a computing device. Many types of online files result depending on the devices. The problem of dealing with these files is a typical case of the problem of dealing with files from other systems discussed above (4a3).

EDITING 4b

Range of Editing Commands 4b1

Status in Existing NLS 4b1a

A full complement of powerful editing features operate

both on structural entities and the existing text entities. The user can name many small text entities (characters, words, and strings of characters). Sentences and larger text entities are missing, such as paragraph, section, chapter. Additional entities and synonyms for the names of certain existing structural entities such as Section, Chapter, and Document would be very useful. In practice, the flexible NLS structure makes the omission largely a matter of missing terminology rather than missing functions for experienced users.

Analysis of Implementation 4b1b

Creating synonyms which are publication terms for existing NLS entities is a trivial programming task with CML (6). The most difficult part is selecting appropriate terms and avoiding alphabetical conflicts. New entities within paragraphs may have to be defined. Again, the most difficult part of the job is defining the entities conceptually. The most important of these, the sentence, has already been implemented by a user and only requires transfer to the running system. It would not be difficult to allow users to create their own entities by defining the limits at their discretion. For example, someone writing stories with dialogue could define a "quote" as anything with quotation marks on each end and then move, delete, etc., "quotes" from place to place.

New entities that would be more effective isolated as properties (4a4) such as headings, footnotes, comments, and glosses would require somewhat greater effort.

Implementation Cost 4b1c

Synonyms: one person-month.

New text entities, including build-your-own: one person-month.

Four types of text that are new properties: two person-months.

Print Filtered Versions of Documents 4b2

Except for filters based on certain entities such as

headings, this facility exists in NLS. Implementation of the entities based on properties discussed above would automatically extend to printing, so no effort beyond implementing the entities would be necessary to complete this feature. 4b2a

Automatic Spelling and Punctuation Correction 4b3

Status in Existing NLS 4b3a

Rather awkward access to a useful spelling checker provided by the operating system exists in the running version of NLS (8.5). A very effective spelling checker was implemented under the contract that supported this study in the experimental version of NLS (9.0), not yet widely distributed to users.

Elementary punctuation correction exists in NLS (e.g., adjust the spaces after periods, commas, etc.) but it could be extended.

Analysis of Implementation 4b3b

Punctuation correction, beyond what is available in NLS, becomes increasingly difficult because more intelligence is required of the algorithms involved. Correction for the comma preceding the conjunction in a series of three or more items is a possible example. But the task approaches machine translation as a limit. Careful analysis must be made before we attempt to provide features that are not cost effective.

Implementation Cost 4b3c

One person month to consider what might be reasonable to attempt.

Global Replace 4b4

Status in Existing NLS 4b4a

A global replace command exists in NLS. It is very useful and is the main method of correcting text in TNLS. It has three important limitations:

It does not accept ellipses in the text being replaced.

The object of substitutions are not highlighted.

The reader does not have the option of choosing whether to implement the replacement case by case, stepping through the document.

Analysis of Implementation 4b4b

Implementation is straightforward, and indeed, similar features have been implemented for their own use by some users.

Implementation Cost 4b4c

Three to four person-weeks.

No Computer Boundaries for Commands 4b5

Status in Existing NLS 4b5a

Two boundaries interfere with publications work in NLS: statements are limited to about 2000 characters, and files are limited to about 350 pages. Normally, publications people use NLS statements to represent paragraphs and when we discuss the need for a paragraph entity, we mean a functional renaming of the statement with "paragraph." However, paragraphs in technical documentation longer than 2000 characters are fairly common. At present, people using NLS usually rewrite the paragraph, often to the benefit of clarity, but nevertheless, the system should not impose rewriting. As screens become larger, longer paragraphs will become more attractive. It should be possible to write a paragraph of any reasonable length (say up to 10,000 characters or 2000 words).

Normally, NLS commands are restricted to single files, which cannot be more than about 350 pages of text. For longer documents, publications people normally assign each chapter into a file and then assemble the whole document procedurally, or with the NLS Include facility, which allows the user to portray (display or print) several files as if they were one file.

Analysis of Implementation 4b5b

Long Statements (paragraphs): Requires some changes to the way text and statements are mapped in NLS

files. These changes are at a basic level and will require careful planning and workmanship to avoid creating unexpected bugs and to dovetail smoothly with existing files.

Long Files: Take advantage of existing mechanisms for long files in the TENEX and Tops-20 operating systems (and may not be directly extensible to other operating systems). It will make possible files up to the equivalent of about 3000 typed pages. Programming will be required so that NLS, when loading any file, knows which type of file is involved (11).

Implementation Cost 4b5c

Long Statements (paragraphs): Four person months

Larger Files: About six person months

Portray Formatted Draft at Any Time 4b6

Status in Existing NLS 4b6a

Once a format has been selected or designed for a document, it is normally possible to obtain a formatted draft in NLS, but there are several serious restrictions. If the format is for monospaced printing, the draft can be created on a line printer or typewriter workstation effectively; if the format requires proportional type, it is necessary to portray the formatted version on a graphics display screen, where characters are only a poor approximation of the format, on a raster printer of a type not generally available (Xerox XGP), or print out a "COM Test".

A "COM Test" is a printed version of the computer's description to itself of the lines to be printed, their location on the page in coordinate numbers, line length to thousandths of an inch, and font size and style. "COM Tests" are useful to specialists but they are unintelligible to all but a few users and require study to interpret at best.

More serious, it is not possible to edit the file in its formatted form; if a user wants to make a change in form or content, (s)he must return to the unformatted version, make the change, and create a new formatted version at a cost in processing and delay.

Analysis of Implementation 4b6b

Implementation for Displays

Display implementation requires full-page displays such as those in use for NLS Graphics or those discussed in 4j1 and (8). Implementation also assumes implementation of a multi-pass system as discussed in 2b3.

Once a data structure has been created in the multi-pass system, it would be relatively straightforward to create a two-workstation system where the user would see the formatted page on a suitable display, much as (s)he now sees a formatted page in the NLS proof system, and at the same time see a normal NLS file on the second display. (S)he would then make a change in the normal NLS file and command the system to display the page as changed. The Output Processor could construct the appearance of the new page from the data structure without reprocessing the whole preceding document and show the new page with reasonable responsiveness.

It is possible to create a one-display system where only the formatted version is portrayed and the user addresses and changes it directly. In fact such systems exist, but they are generally standalone systems limited to functions associated with photocomposition. In the context of NLS, making dynamic changes in formatted text means returning to the data structure created by the first processor pass in addressing the items on the screen and in recreating the display after a change that precedes it in the file. One consequence is that the user gives up much of the advantage gained by NLS' random file structure, and changes in the later part of a long file may appear on the screen slowly.

Printed Proofs

The user may desire printed proofs. If a local photocomposition device or raster printer (17) is available, the task is limited to adaptation of the NLS virtual COM interface to the printer. If the user is working through the network, some local storage may be necessary to use the raster printer. If only monospaced printers are available, a page

proof surrogate will be required. A page proof surrogate is an oversized page printed on a monospaced printer where the relative location of the lines and graphic elements are roughly correct, although the exact length of the lines may vary because of the difference in width between monospaced and proportionally spaced characters. Assuming the existence of a multi-pass system, it is a straightforward task to produce page proof surrogates of any given page as changed on the basis of the software that produces COM tests.

Implementation Cost 4b6c

Second screen display of changed pages, assuming a multi-pass Output Processor: One to three person-years.

Dynamic display of formatted files as they are changed: Three person months to study how hard it is.

The software to connect any given raster printer to the Output Processor: One to six person-weeks, depending on the printer involved.

Page proof surrogates based on a multi-pass output processor: One person month.

Blue Pencil Editor 4b7

Status in Existing NLS 4b7a

No such function exists in NLS.

Analysis of Implementation 4b7b

Comments would be stored as more properties (4a4e) of the statement. Creating commands to accept input, attach them as properties, and control them internally as separate properties is routine. The most difficult area is portrayal. It must be possible to portray the basic text as if changes were implemented, with suggestions as clearly separate text, and with replacements and suggestions suppressed. As long as the dominant displays are the general size of 25 lines by 80 columns, comments will have to be marked off by crude formatting and or special characters such as strings of asterisks. Full-page displays that allow

different font sizes and styles are obviously well suited to this situation. A workstation based on two 25 x 80-character displays would be an inexpensive interim solution.

The teletype version of the system should have the same alternatives for printing or suppressing the comments. Comments should be printed with crude formatting or special characters to reproduce or closely resemble the portrayal on one screen.

Implementation Cost 4b7c

For a version that could be displayed on one or two workstations, the estimate is four person months, assuming the existence of a two-display workstation. It has been estimated that development of a general-purpose, two display workstation, using the version of an NLS workstation based on the Intel 8080 now under development, would require one to three person months (10). A Blue Pencil Editor that took full advantage of a full-page display that allowed different font sizes and types would require two person months more.

Text Editing Works on Text in Illustrations. 4b8

Status in Existing whole NLS 4b8a

The text in graphics in NLS files is not accessible to normal NLS commands that control text. A user who wants to change a caption must replace the whole caption, and a user who wants to search for a particular word must do so by eye.

Analysis of Implementation 4b8b

See 2c6f.

System Will Highlight Text that Is the Object of Commands. 4b9

Status in Existing NLS 4b9a

Highlighting is not in use in NLS 8.5 except for marking the cursor address with a bright "D".

Analysis of Implementation 4b9b

In NLS 9 the software is present to implement

highlighting in general, but it is not used in many commands. The difficulties are chiefly conceptual, the problem of what should or should not be highlighted and the ambiguities caused by a lack of feedback because one cannot show cumulative highlights piling up.

Implementation Cost 4b9c

Programming, one person-week; decisions on what to highlight, one person-week.

ILLUSTRATION 4c

The material on illustration discussed in (29000,8c) is discussed at 2b in this report. 4c1

BIBLIOGRAPHIC AIDS 4d

Automatic generation of tables of contents, lists of figures, changed pages, indices, bibliographies, and glossaries. 4d1

Status in Existing NLS 4d1a

A somewhat awkward method exists in NLS to create tables of contents, lists of figures, and the like. Note that it suffers from the restriction on display of formats discussed in 4b6; if the file is changed, it must be wholly reformatted before the change appears in the list. It is possible to create indices in NLS only for very brief documents and those indices cite outline numbers rather than page numbers. It is possible to create bibliographies of items that are known to the NLS catalogue system.

No provision exists for listing changed pages or generating glossaries.

Analysis of Implementation 4d1b

A multi-pass system will eliminate the awkwardness in creating tables of contents discussed above. A small amount of programming will be necessary to create di-

rectives that take advantage of the new arrangement. A little more programming would be necessary for each new function, such as a list of figures.

In the context of NLS, index programs might be of two types:

Index programs that would run at any time on NLS files and create indices that cite outline numbers. Such software should only be implemented after one of the keyword systems is implemented as discussed in 4a4. At that point, it would be a small programming task to implement appropriate commands.

Indexing software that would be part of the Output Processor and would created paged indices when files were formatted for printing. Such software should only be implemented after the multi-pass system and its data file are implemented as discussed in 2b. At that point, creating indices would be a small task of creating proper directives to allow the user to control the indexing and set up an appropriate format.

In both cases the system should give the user access to a standard list of exceptions, create and delete exceptions, control the span of text indexed, and allow for cumulative indexing of groups of documents and dynamic indexing of functional documents.

In this context, glossaries are only a special kind of index where the user adds to the index entry. Also in this context, lists of changed pages are only special kinds of lists, such as lists of figures, selected on the basis of the existing Output Processor filters, to select text changed since a given date.

Implementation Cost 4d1c

Tables of contents (or of figures, etc.), assuming a multi-pass system: One person-week.

Outline indices, assuming a keyword system: One person month.

Paged indices, assuming a multi-pass Output Processor: One person month.

Glossaries, assuming paged indices: One person-week.

Lists of changed pages, assuming a multipass processor: Two person-weeks.

System Will Lay Out Footnotes. 4d2

Status in Existing NLS 4d2a

NLS has no provision for handling footnotes.

Analysis of Implementation 4d2b

It is possible for the NLS Output Processor to set most footnotes in technical documentation without a multi-pass procedure. It is merely necessary for a piece of text to be identified to the Output Processor as a footnote (e.g., by being stored as a footnote property), and for the Output Processor to then format the footnote, count the lines necessary to house it, subtract them from the current line count of its page or column, and continue setting the page or column until the space is used up. At that point, it will insert the stored footnote.

This implementation would require a set of directives to format the footnotes, similar to the directives that format headers, and a directive to control footnote numbering. It should allow footnotes to be bunched at the end of a chapter, or the end of a document.

This implementation would not cope with the case where a footnote was larger than a page or column, or should span two pages or columns for aesthetic reasons. Such cases are not the rule in technical documentation, but they certainly occur. They require a more complex set of rules and demand a multi-pass Output Processor.

Implementation Cost 4d2c

One-pass footnoting based on a footnote property: Two person-months.

There is considerable range of complexity in the rules that different technical publications impose on footnote formats with respect to their location and division of pages. Assuming the existence of a multi-

pass Output Processor and a footnote property, a simple algorithm to handle the case where there is not room on a page for a footnote or footnotes would require about one-half person-month.

System Will Format References 4d3

Status in Existing NLS 4d3a

NLS will create bibliographic references if the references are known to the catalogue system.

LAYOUT AND DOCUMENT DESIGN 4e

Document design is a difficult and specialized programming area where the builders of this report were largely lacking in expertise before we began our work. On the basis of the background we had, a great deal of reading, and conversations and visits with people involved in the field, we were able to sketch out the model presented in the Phase II report. Further study would be necessary for us to discuss implementation. There are many complex questions in terms of data handling, file control, and command language and terminology, particularly considering the complex history of traditional methods and vocabulary and its dependence on graphic conceptions. We estimate about one-half person-year would be necessary to bring us to the point where we could discuss implementations of Layout and Document Design functions based on NLS on the level of detail characteristics of this report. 4e1

A word should be said about priority. Most technical publications groups produce documents that use a few formats over and over, or at least create new formats very infrequently, and modify old ones only to a limited degree. Such publications groups can get on without special aids to book design, as is the case with groups now using NLS. At the other end of the spectrum are, for example, text book publishers who commonly create an elaborate new design for each book. We foresee pursuing this area only as organizations that produce and change a relatively wide range of formats become involved in the NLS community. 4e2

COMMUNICATION 4f

Message Sending 4f1

NLS has a comprehensive range of message sending facilities, ranging from easy-to-send, ephemeral messages to a "journal" system that combines postal, filing cabinet, and library retrieval functions. Except for certain details, NLS message facilities could support the Agent as they stand. 4f1a

Terminal Linking 4f2

NLS has excellent terminal linking facilities both in typewriter and display mode. In display mode, two or more distant users may not only see the same display, but work on the same file jointly as displayed. The terminal linking features are adequate to the needs of the model document production system. 4f2a

Recorded Dialogue 4f3

The "journal" system mentioned above supports and records work dialogue. It is also possible to record linked terminal sessions. These facilities are adequate for the model document production system. 4f3a

Teleconferencing 4f4

NLS has no formal teleconferencing facilities. The dialogue support and electronic mail facilities serve many of the functions of teleconferencing; they are adequate for the model document production system. 4f4a

PROCESS CONTROL 4g

Historically, NLS has been used very little for process control. This omission largely stems from consistent application of NLS to jobs like communicating via text, document production, and programming, which have not frequently been addressed in term of process control in the past. Users have, however, created a few simple systems related to process control that are of historical value. Several users have created calendar subsystem to integrate the work flow in offices and perform similar functions. One user group created a primitive Production Control Systems to monitor the progress of tightly scheduled documents being created manually. These systems are not directly applicable to development of a system like the Agent for programming reasons, but they provide some valuable experience. 4g1

As is the case with Layout and Document Design, we feel unable to describe implementation and give cost estimates for the functions of process control described in the Phase II report. We estimate that about one person-year of effort would be necessary to present a sketch of implementation and cost estimates comparable in detail to other parts of this report. 4g2

SYSTEM RELIABILITY AND RESPONSE 4h

Central Computer to Accommodate Operations Over Large Files 4h1

See 4b5 above. 4h1a

File System Backup--Automatic Duplication 4h2

Status in Existing NLS 4h2a

Primitive automatic file system transfer procedures have been created by users of the ARPA Network.

Analysis of Implementation 4h2b

Automated file backup in the context of the ARPA Network, or networks using similar technologies (e.g., Telnet) or between machines that have hardwired connections, is a straightforward matter of combining existing software procedures and creating a graceful set of commands for the user. However, , see immediately below for further questions of reliability.

Implementation Cost 4h2c

About one person-month programing for simple backup.

System Reliability and Distributed Processing. 4h3

Status in Existing NLS 4h3a

As discussed in the previous two reports, we favor processing on large central machines for a variety of reasons, but that is a risky course in terms of reliability. One solution is to run two mainframes in parallel. PCS follows approximately that solution (1). We believe that in the long run, that solution is prohibitively expensive. In the two-mainframe sit-

uation, the two systems must be completely redundant and constantly mutually updated. If they are not, as they are not in the case of PCS, the users will experience some loss of work or service.

It has been suggested that networks of mini-computers solve this problem (16); operation experience exists with such networks. We believe they are essentially a more complicated version of two mainframes. The user still risks similar loss of work and time and, in addition, a more complex file handling package is necessary.

We believe that a combination of simple backup mechanisms, as described above in 4h2, and used sparingly at critical times, with processing and files distributed at micro-processor based workstations, offers the best reliability for reasonable cost as well as advantages of quick response and privacy.

Analysis of Implementation

In general, NLS is built in a modular way which was planned partly to facilitate dispersing functions among machines. In particular, it is divided into a "frontend" and a "backend" which can run on different machines (19). The frontend, which includes all command feedback to the user, could run on a rather large minicomputer local to a group of users who would draw on the power of the backend for certain software procedures.

Our current thinking favors use of a workstation based on three microcomputers of the 8080 class with 100,000 or 200,000 bytes of memory. Fitting NLS into this workstation requires considerable work. The frontend will have to be redesigned to make it smaller. It might be necessary to restrict some features, as for example, restrict users to one recognition mode and to restrict the functions of the Help system. The editing part of the backend has to be redone to dovetail with the new front-end. A piecemeal file system has to be created to move parts of files back and forth from the mainframe.

Implementation Cost

Two to six person-years programming before the sys-

tem is ready to go into the hands of users. Two or three thousand dollars worth of hardware would be involved at each workstation at current prices.

Highly Interactive 4h4

Status in Existing NLS 4h4a

Highly interactive response can come either from allocation of a substantial amount of computer resources, or from dispersion of certain functions to micro- or minicomputers near the user (see 4h3).

Feedback Supporting Typing Speeds up to 100 Words per Minute 4h5

In an NLS environment, response of that sort can come only from dispersion of certain functions to micro or mini-computers near the user (see 4h3). 4h5a

Mean Response Time for Simple Operations of Less than 2 Seconds with Standard Deviation of Not More than 1 Second 4h6

Holding response time below a certain level is essentially a matter of resource allocation or distributed processing (see 4h4) above. Timing is quite another matter. Any competent typist will tell you that the feel of the machine, which includes rhythm, makes all the difference. Everyone knows that rhythm and timing make all the difference in any repetitive physical activity. A good keyboard helps, but the response of timeshared systems, except when lightly loaded, is characteristically arhythmic because the interference from other jobs is not predictable. The little research done on this subject (13, 14, 18) indicates that greatly variable response time may be more objectionable than slow response. A slow but consistent system may be more comfortable than an erratic system with a fast average response. Very little development has been done to implement smooth response in running timeshared systems. Hence, we cannot describe implementation in NLS or anticipate its cost. Fundamental research needs to be done, programmers need to concern themselves with things they heretofore ignored, and, probably, fundamental improvements need to be made in hardware. 4h6a

Several Hundred Page Local Terminal File System Capacity for Backup and Privacy 4h7

See 4h4 above. 4h7a

Local Processor Input and Editing 4h8

See 4h4 above. 4h8a

Noninteractive Facilities Available if Desired 4h9

Status in Existing NLS 4h9a

An offline input system exists in NLS, the Deferred Execution System (DEX), where users may type text onto cassettes with any one of several inexpensive typewriter-like workstations and with very simple editing. The cassettes can be read into the main computer economically at off hours.

In addition, several users have developed methods of moving texts from magnetic storage, such as diskettes attached to intelligent terminals, into NLS. Each of these processes has been jury-rigged. The processes are a special case of the general problem of moving files from other systems as discussed above at 4a3.

Analysis of Implementation and Cost 4h9b

The commands to move the text from the cassettes to online files offer some difficulties, and a couple of person-weeks of programming would be necessary to make them smooth. The proper general solution is the distributed programming described in 4h4.

USER CONTROL AND SYSTEM FEEDBACK 4i

CRT Display Screen Capable of Displaying Straight Text 4i1

Such a display already exists on NLS. 4i1a

CRT Display Screen Capable of Displaying Common Special Characters 4i2

Status in Existing NLS 4i2a

NLS does not now use a terminal that can portray common special characters (the Greek alphabet and a dozen

or so common mathematical characters). More such displays are becoming available, for example, the Hewlett-Packard 2400 series terminals.

Analysis of Implementation 4i2b

Use in NLS of terminals that display special characters demands designing and building a workstation architecture and establishing conventions in NLS files for representing the special characters.

Implementation Cost 4i2c

Two to three person months for a general system to represent non-ASCII characters in NLS files. Time for programming to match terminals is uncertain but is not likely to exceed one person month for each type of terminal.

Feedback May be Controlled According to User Desires 4i3

Status and Implementation 4i3a

NLS feedback comes in the form of words or abbreviated prompts that specify what type of command the system is waiting for, give information to guide the user through the command, and indicate what type of input the system needs at each step. The user can trim the amount of such information the system supplies step by step to zero. In general, we believe this is sufficient control of feedback. Other feedback control might be attractive in specific situations and would have to be priced case by case.

Menu or Function Button Interfaces also Available 4i4

Status in Existing NLS 4i4a

Function buttons are used in NLS only for certain widely used commands, e.g., to repeat the previous command or to ask for help. NLS 8.5 readily lists possible commands to the user on the screen, but does not offer menus where the user may implement commands by pointing to them.

Considering the tradition of function buttons in publication work (based ultimately on the keyboards of

devices like a Linotype), it might be attractive to duplicate some NLS command actions through function buttons.

Analysis of Implementation 4i4b

A display of NLS commands that the user could control by bugging would require one person-month programming. The number of NLS commands and alternatives in certain subsystems exceeds the size of the smaller displays, and the menu system will require careful design to be useful - one person-month design. Implementation of function buttons would essentially be taking the output of the key and treating it as a synonym of an NLS command or command step. In many cases function buttons in the publications world set up format. In those cases, the button would activate a version of the insert text command which would write the appropriate Output Processor directive(s) into the file much as does the present Insert Date command.

Implementation Cost 4i4c

About two person months for a set of function buttons of a typical publications keyboard.

CRT Display Screen Capable of Displaying Formats as Printed with Font Changes, Headers, etc. 4i5

Status in Existing NLS 4i5a

The screens normally used with NLS, 24-line by 80-column 5 x 7 dot matrix black and white TV screens, can display formatted material only in a monospaced font and only about half a page at a time. Special screens available at a few work sites and at a cost of about $12,000 can display formatted material in full pages with proportionally spaced lines and a rough approximation of type size ranges.

Analysis of Implementation 4i5b

A breadboard model of such a terminal has been developed at ARC (8). Most of the hardware development is completed. The bit map has to be made operational to display proportional type and the quality of the type has to be improved. Various tasks are necessary to convert the breadboard to something that can go to

users. Considering the current activity among hardware manufacturers in this area, we believe it would be a wise expenditure of resources to watch closely new screens that are developed and integrate them into NLS workstations as appropriate.

Implementation Cost 4i5c

If we decided to go ahead from the breadboard to a prototype, it would require one person-year to finish the prototype and one more person-year to create a product version.

System Will Interrogate for Parameters for Processes 4i6

Status in Existing NLS 4i6a

The CML includes provision for interrogating users, and NLS interrogates user for parameters in a number of applications outside of publications (6).

Implementation and Cost 4i6b

Costs are small and are included in estimates for development of various features.

Structural Filters 4i7

Status in Existing NLS 4i7a

NLS has a very powerful set of structural filtering tools based on its general-purpose hierarchical organization of files. For example you may move, delete, print, etc. a statement that has substatements containing a certain word. To be easy to use in a publication contest, this capability should be able to select on the basis of the publication entities and terminology discussed above in 4b1a. The reprogramming discussed there would make filters, based on paragraphs, for example, available at no extra cost.

Full Addressing Scheme 4i8

NLS has a satisfactory addressing scheme with the exception that the user cannot address by its normal publication name any part of a document except a word or char-

acter. The reprogramming discussed at 4b1a would make publications terms available for addressing without extra cost. 4i8a

"Undo" Facility 4i9

Status in Existing NLS 4i9a

No such facility exists in NLS.

Analysis of Implementation 4i9b

Appendix I of the Phase II report calls for the ability to undo all commands but that is obviously out of the question. In the case of certain commands, undoing is meaningless, e.g., Output Printer and Expunge Directory. In the case of others, the expense is obviously far more than its worth, e.g., Update Compact. The ability to undo editing commands is a reasonable goal. It would be possible to store the results of editing commands in such a way that the user could always undo the action of the previous command at a cost of two to five percent in execution time. The user could turn this feature on or off.

Implementation Cost 4i9c

Programming to undo editing commands in one file only, two person months; to undo editing commands that involve cross file editing, four more person months.

Feedback Available 4i10

Status in Existing NLS 4i10a

NLS provides thorough command feedback along with means to restrict it for experienced users. Furthermore, changing command feedback is a trivial programming task (6).

Analysis of Implementation 4i10b

Implementation Cost 4i10c

Help Available in Prose Description 4i11

Status in Existing NLS 4i11a

NLS Help facilities offer prose descriptions of how to use the system, particularly the commands, based on keywords or what the user is doing when he calls for help. The Help system is handicapped by slow response, by difficulties in delivering to the user just the information he wants, and by providing the same responses to experienced or naive users.

Analysis of Implementation 4i11b

Reprogramming Help to take advantage of better search facilities (keywords, see 4a4) would moderately improve response. Only greater resources, such as faster hardware, will speed Help greatly. Reprogramming Help and the NLS User Profile system to allow Help to offer different answers to naive, ordinary, or sophisticated users (or possibly to publications users as a group) is a modest programming job, but a substantial writing job. When NLS is implemented at a microprocessor-based workstation, considerable thought must be given to the effect on Help. Probably we will have room for only a small allocation of Help data at the workstation, but it will be displayed with rapid response.

Implementation Cost 4i11c

Reprogramming Help for faster searches, 3 person months. Reprogramming Help and User Profile to identify classes of users, one person-month. Rewriting the Help data base for different classes of users, one person-year.

Syntactic and Help Available Through the System 4i12

NLS can provide the user with the formal syntax of the current command at any time. 4i12a

Filters by Content 4i13

NLS facilities for filtering by content are more than adequate for document production purposes. 4i13a

Organizational Units as Objects: 4i14

Documents, Volumes, Chapters, Groups of Structural Entities 4i15

Status in Existing NLS 4i15a

See 4b1a above.

Repeatable Commands 4i16

It is possible to repeat commands in NLS once or as many times as the user desires. 4i16a

User Can Stop any System Process 4i17

Status in Existing NLS 4i17a

This is a complex situation in NLS as in most large interactive systems and difficult to describe briefly. It is always possible to stop a process by interrupting the operating system in NLS, but the user in that situation may not be then able to go on gracefully to other activities.

Relative to stopping, the large majority of NLS processes fall into one of three classes: string processing, editing, or showing.

In current NLS a user may stop any string processing (e.g., printing or searching for content) quickly (but not instantly), and will normally be able to go on freely from that point.

There is no more effective means to stop editing commands than allowing them to complete and then undoing them as discussed in 4i9b. By commands that show we mean those that display some set of data, e.g., the contents of a directory, without writing in a file. In NLS 9 it is possible to stop such portrayal gracefully.

Certain processes, e.g., updating a user profile, fall outside these categories, but they are all unusual events in a users working life. It is theoretically possible to arrange to stop them through check-point procedures, but we do not think it worth the trouble. When NLS 9 becomes the running system and the Undo features is implemented, the stop functions discussed in 812d of 29000 will be, in effect, available.

Commands May be Tailored to User (or Group) Needs and Styles 4i18

This is another complex question and the answer depends greatly on the needs of the user. As noted above, it is easy to change command and prompting terms (6). NLS offers several command recognition styles and it is a smaller programming task to create others than in most large interactive systems. Changing the order in which the user must enter command elements, or implementing quite different forms, such as function buttons, is more difficult, but, again, easier than in most similar systems. In summary, NLS offers an unusually flexible basis for tailoring commands and has been used as a front end for other systems for that reason, but the implementation and cost effectiveness of tailoring must be decided case by case. 4i18a

Record of Date and Time of Change and Person Making that Change Associated with Material 4i19

Status in Existing NLS 4i19a

NLS records the time to the minute and the ident of the person who made the last change. In publications work it is frequently a problem that some automatic process, for example, a formatter, touches all or most of the statements in a file and so effectively erases the record of editing and revision.

Analysis of Implementations 4i19b

It is possible to allow changes by specific processes that are not recorded on the statement signatures.

Implementation Cost 4i19c

Two person-weeks.

Windowing Capability: Dividing Screen into Several Areas for Display of Material 4i20

Status in Existing NLS 4i20a

NLS can divide both text and graphic display screens effectively into several windows for cross-document editing and the like. See also the discussion of multi-window workstations in (10).

Teletypewriter System as Supplement: As Similar to the Display System Conceptually as Possible 4i21

Status in Existing NLS 4i21a

The teletypewriter version of NLS is consistent conceptually with the display version, and uses the same commands except for commands that apply only to one medium or the other.

Many objects for each command action: words, text, sentences, special type-face phrases, paragraphs, pages, headings, captions, footnotes, equations, lists, table entities. 4i22

See 4b1. 4i22a

WORKSTATION ENVIRONMENT 4j

Full Page Alphanumeric Display 4j1

See 4i5. 4j1a

Cursor Controller 4j2

An excellent cursor controller exists in NLS in the form of the mouse which users roll on table tops. 4j2a

Photographic or Xerographic Printer (produces different fonts but not necessarily drawings) 4j3

Status in Existing NLS 4j3a

The NLS Output Processor formats its proportionally spaced output for a "virtual COM device." On the basis of this output, it is relatively simple to write a separate, stand-alone package for every individual device. Implementations depends on the device. In fact, software exists for output to several COM devices, but only to one relatively unusual Xerographic device, the Xerox XGP, which produces both proportionately spaced printing and graphics from NLS.

Implementation and Cost

See 4b6.

24 Line by 80 Column Alphanumeric Display 4j4

Status in Existing NLS 4j4a

This is the size of the displays commonly used with NLS.

Scrolling. 4j5

Status in Existing NLS 4j5a

NLS displays advance text by the hierarchical units called statements, usually paragraphs in a publications context. NLS lacks line-by-line scrolling and lacks horizontal scrolling.

Analysis of Implementation 4j5b

Straightforward changes in backend display code and writing commands to control their action.

Implementation Cost 4j5c

Two to six person-weeks.

Multiple Windows and Multiple Display Workstations 4j6

Status in Existing NLS 4j6a

NLS divides the working screen gracefully into windows for displaying different files or parts of a file. Workstations allow only a single display except in the case of special workstations used with high resolution graphics display.

Implementation and Cost 4j6b

See 4b7.

Interface to Mixed Text and Graphics Printer 4j7

See 4j3 above. 4j7a

Impact Printer. 4j8

NLS formats output for a range of impact printing devices. 4j8a

Formatting Display, Larger than 140 Lines by 170 Columns 4j9

Status in Existing NLS 4j9a

No such displays exist in NLS.

Analysis of Implementation 4j9b

Implementation Cost 4j9c

Drawing Table Display for Illustration and Layout, Approximately 3 by 4 Feet 4j10

No such hardware is commercially available and developing it would not be an appropriate expenditure of resources available to ARC. We suggest keeping track of commercial developments and considering integration of larger screens into NLS workstation when they are available. It is impossible to anticipate costs until we see the equipment. 4j10a

Ability to Display Special Characters, Such as Greek alphabet and Math Symbols 4j11

See 4i2. 4j11a

Drawing Pen 4j12

Status in Existing NLS 4j12a

NLS uses the mouse cursor control instead of a drawing pen. This device is preferable in most publication contexts both because of prices and because of human engineering (it does not have to be lifted to the screen). A light pen might be desirable in certain types of graphic work (see 2c6a) . It is impossible to forecast programming cost until the work on the files discussed in 2c6a is well understood.

Interface to Phototypesetter 4j13

See 4j3 above. 4j13a

CRT Displays with Color 4j14

See 2c6b 4j14a

FILE SYSTEM 4k

Hierarchical Structure 4k1

NLS has a hierarchic file structure highly suited to technical documentation. 4k1a

No Multiple Write Access Except for Terminal Sharing 4k2

NLS and operating file controls prevent multiple access except under carefully controlled conditions. 4k2a

Archive Service 4k3

The operating systems associated with NLS have archiving system adequate to publication purposes. 4k3a

Sequential Numbering 4k4

The units (statements) of an NLS file may be numbered sequentially, lines cannot because they depend on the output device. 4k4a

Indexing System 4k5

See 4a4. 4k5a

Hierarchical Numbering 4k6

NLS has a thoroughly satisfactory hierarchical numbering system for publication purposes. 4k6a

Storage of Nontextual Data 4k7

NLS has an unusual capacity to store nontextual data built into its file structure, see 4a4. At the moment, line drawings and the name and time associated with the last change are the only nonalphanumeric elements stored in NLS files. 4k7a

Limitless Documents 4k8

See 4b5

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* Because we believe an important and substantial portion of the readers of this report will be people involved in NLS development and will have access to its online Journal system, we have included a number of documents not widely available outside the system but readily available online. Asterisks mark these narrowly distributed documents.

TABLE OF CONTENTS

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COMPARISON OF NLS TO A DOCUMENT PRODUCTION MODEL

Dirk van Nouhuys, Elizabeth Michael,
Raphael Rom, and Harvey Lehtman

September 26, 1977

ARC Catalog System Number 40002

```
*START* User TRANS  Job  PWEFA Seq. 2689 Date 14-Feb-78 15:13:41 Monitor SRI-KL


TTTTTTTTTT     RRRRRRRR        AAAAAA      NN      NN      SSSSSSSS
TTTTTTTTTT     RRRRRRRR        AAAAAA      NN      NN      SSSSSSSS
    TT         RR      RR     AA    AA    NN      NN     SS
    TT         RR      RR     AA    AA    NN      NN     SS
    TT         RR      RR     AA    AA    NNNN    NN     SS
    TT         RR      RR     AA    AA    NNNN    NN     SS
    TT         RRRRRRRR       AA    AA    NN  NN  NN      SSSSSS
    TT         RRRRRRRR       AA    AA    NN  NN  NN      SSSSSS
    TT         RR  RR         AAAAAAAAAA    NN    NNNN            SS
    TT         RR  RR         AAAAAAAAAA    NN    NNNN            SS
    TT         RR    RR       AA    AA    NN      NN            SS
    TT         RR    RR       AA    AA    NN      NN            SS
    TT         RR      RR     AA    AA    NN      NN     SSSSSSSS
    TT         RR      RR     AA    AA    NN      NN     SSSSSSSS
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*START* User TRANS  Job  PWEFA Seq. 2689 Date 14-Feb-78 15:13:41 Monitor SRI-KL

*START* User TRANS  Job  PWEFA Seq. 2689 Date 14-Feb-78 15:13:41 Monitor SRI-KL

*START* User TRANS  Job  PWEFA Seq. 2689 Date 14-Feb-78 15:13:41 Monitor SRI-KL

*START* User TRANS  Job  PWEFA Seq. 2689 Date 14-Feb-78 15:13:41 Monitor SRI-KL

*START* User TRANS  Job  PWEFA Seq. 2689 Date 14-Feb-78 15:13:41 Monitor SRI-KL
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Mark Crispin (MIT-AI)
RFC 727, NIC 40025 (Apr. 27, 1977)

TELNET Logout Option

1. Command name and code.

   LOGOUT 18

2. Command meanings.

   IAC WILL LOGOUT

   The sender of this command REQUESTS permission to, or confirms that it will, forcibly log off the user process at its end.

   IAC WON'T LOGOUT

   The sender of this command REFUSES to forcibly log off the user process at its end.

   IAC DO LOGOUT

   The sender of this command REQUESTS that the receiver forcibly log off the user process at the receiver's end, or confirms that the receiver has its permission to do so.

   IAC DON'T LOGOUT

   The sender of this command DEMANDS that the receiver not forcibly log off the user process at the receiver's end.

3. Default.

   WON'T LOGOUT

   DON'T LOGOUT

   i.e., no forcible logging off of the server's user process.

4. Motivation for the option.

Often, a runaway user process can be hung in such a state that it cannot be interrupted by normal means. Conversely, the system itself can be bottlenecked so that response delays are intolerable. A user (human or otherwise) eventually will time out out of frustration and take the drastic means of closing the connection to free itself from the hung process. In some situations, even the simple operation of logging out can take a long time.

Some systems treat a close to mean that it should log out its user process under it. However, many hosts merely "detach" the process so that an accidental close due to a user or temporary hardware error will not cause all work done on that job to be lost; when the connection is re-established, the user may "attach" back to its process. While this protection is often valuable, if the user is giving up completely on the host, it can cause this hung job to continue to load the system.

This option allows a process to instruct the server that the user process at the server's end should be forcibly logged out instead of detached. A secondary usage of this option might be for a server to warn of impending auto-logout of its user process due to inactivity.

5. Description of the option.

When a user decides that it no longer wants its process on the server host and decides that it does not want to wait until the host's normal log out protocol has been gone through, it sends IAC DO LOGOUT. The receiver of the command may respond with IAC WILL LOGOUT, in which case it will then forcibly log off the user process at its end. If it responds with IAC WON'T LOGOUT, then it indicates that it has not logged off the user process at its end, and if the connection is broken, the process very possibly will be detached.

A truly impatient user that feels that it must break away from the server immediately could even send IAC DO LOGOUT and then close. At the worst, the server would only ignore the request and detach the user process. A server that implements the LOGOUT option should know to log out the user process despite the sudden close and even an inability to confirm the LOGOUT request!

6. A sample implementation of the option.

The server implements the LOGOUT option both for accepting LOGOUT requests and for auto-logout warning.

Case 1:

The user connects to the server, and starts interacting with the server. For some reason, the user wishes to terminate interaction with the server, and is reluctant to go through the normal log out procedure, or perhaps the user is unable to go through the normal log out procedure. It does not want the process at the server any more, so it sends IAC DO LOGOUT. The server verifies the request with IAC WILL LOGOUT, and then forcibly logs off the user process (perhaps by using a system call that causes another process to be logged out). It does not have to close the connection unless the user closes or it wants to close. Neither does it wait until the user has received its confirmation--it starts the log out immediately so if the user has in the mean time closed the connection without waiting for confirmation, its logout request still is performed.

Case 2:

The user connects to the server, and after logging in, is idle for a while, long enough to approach the server's autologout time. The server shortly before the autologout sends IAC WILL LOGOUT; the user sees this and sends IAC DON'T LOGOUT, and continues work on the host. Nothing prevents the server from logging out the user process if inactivity continues; this can be used to prevent a malicious user from locking up a process on the server host by the simple expedient of sending IAC DON'T LOGOUT every time it sees IAC WILL LOGOUT but doing nothing else.

David H. Crocker (Crocker@RAND-UNIX)
Rand-ISD
Richard H. Gumpertz (Gumpertz@CMU-10A)
Carnegie-Mellon University

RFC 735, NIC 42083 (Nov. 3, 1977)
Obsoletes RFC 729 (NIC 40306)

REVISED TELNET BYTE MACRO OPTION

1. Command name and code:

   BM 19

2. Command Meanings:

   IAC WILL BM

      The sender of this command REQUESTS or AGREES to use the BM option, and will send single data characters which are to be interpreted as if replacement data strings had been sent.

   IAC WON'T BM

      The sender of this option REFUSES to send single data characters which are to be interpreted as if replacement data strings had been sent. Any existing BM <macro byte> definitions are discarded (i.e., reset to their original data interpretations).

   IAC DO BM

      The sender REQUESTS or AGREES to have the other side (sender of WILL BM) send single data characters which are to be interpreted as if replacement data strings had been sent.

   IAC DON'T BM

      The sender REFUSES to allow the other side to send single data characters which are to be interpreted as if replacement data strings had been sent. Any existing BM <macro byte> definitions are to be discarded.

IAC SB BM <DEFINE> <macro byte> <count>
<replacement string> IAC SE

where:

<macro byte> is the data byte actually to be sent across the network; it may NOT be Telnet IAC (decimal 255, but may be any other 8-bit character.

<count> is one 8-bit byte binary number, indicating how many <replacement string> characters follow, up to the ending IAC SE, but not including it. NOTE: that doubled IACs in the definition should only be counted as one character per pair.

<replacement string> is a string of zero or more Telnet ASCII characters and/or commands, which the <macro byte> is to represent; any character may occur within a <replacement string>. Note, however, that an IAC in the string must be doubled, to be interpreted later as an IAC; to be interpreted later as data byte 255, it must be quadrupled in the original <replacement string> specification.

The indicated <macro byte> will be sent instead of the indicated <replacement string>. The receiver of the <macro byte> (the sender of the DO BM) is to behave EXACTLY as if the <replacement string> string of bytes had instead been received from the network. This interpretation is to occur before any other Telnet interpretations, unless the <macro byte> occurs as part of a Telnet command; in this case no special interpretation is to be made. In particular, an entire Telnet subnegotiation (i.e. from IAC SB through IAC SE) is to be considered a Telnet command in which NO replacement should be done.

The effect of a particular <macro byte> may be negated by reseting it to "expand" into itself.

IAC SB BM <DEFINE> X <0> IAC SE may be used to cause X to be ignored in the data stream.

<DEFINE> is decimal 1.

IAC SB BM <ACCEPT> <macro byte> IAC SE

The receiver of the <DEFINE> for <macro byte> accepts the requested definition and will perform the indicated replacement whenever a <macro byte> is received and is not part of any IAC Telnet command sequence.

<ACCEPT> is decimal 2.

IAC SB BM <REFUSE> <macro byte> <REASON> IAC SE

The receiver of the <DEFINE> for <macro byte> refuses to perform the indicated translation from <macro byte> to <replacement string> because the particular <macro byte> is not an acceptable choice, the length of the <replacement string> exceeds available storage, the length of the actual <replacement string> did not match the length predicted in the <count>, or for some unspecified reason.

<REFUSE> is decimal 3.

<REASON> may be

<BAD-CHOICE>	which is decimal 1;
<TOO-LONG>	(for receiver's storage) which is decimal 2;
<WRONG-LENGTH>	(of actual string compared with promised length in <count>) which is decimal 3; or
<OTHER-REASON>	(intended for use only until this document can be updated to include reasons not anticipated by the authors) which is decimal zero (0).

IAC SB BM <LITERAL> <macro byte> IAC SE

The <macro byte> is to be treated as real data, rather than as representative of the <replacement string>

NOTE: this subcommand cannot be used during Telnet subcommands, since subcommands are defined to end with the next occurrence of "IAC SE". Including this BM subcommand within any Telnet subcommand would therefore prematurely terminate the containing subcommand.

<LITERAL> is decimal 4.

IAC SB BM <PLEASE CANCEL> <macro byte> <REASON> IAC SE

The RECEIVER of the defined <macro byte> (i.e., the sender of IAC DO BM) requests the sender of <macro byte> to cancel its definition. <REASON> is the same as for the <REFUSE> subcommand. The <macro byte> sender should (but is not required to) respond by resetting <macro byte> (i.e., sending an IAC SB BM <DEFINE> <macro byte> <1> <macro byte> IAC SE).

If the receiver absolutely insists on cancelling a given macro, the best it can do is to turn off the entire option, with IAC DONT BM, wait for an acknowledging IAC WONT BM and then restart the option, with IAC DO BM. This will reset all other macros as well but it will allow the receiver to REFUSE with code BAD CHOICE if/when the foreign site attempts to redefine the macro in question.

3. Default:

WON'T BM -- DON'T BM

No reinterpretation of data bytes is done.

Motivation for the option:

Subcommands for Telnet options currently require a minimum of five characters to be sent over the network (i.e., IAC SB <Option name> IAC SE). For subcommands which are employed infrequently, in absolute numbers and in relation to normal data, this overhead is tolerable. In other cases, however, it is not. For example, data which is sent in a block-oriented fashion may need a "block separator" mark. If blocks are commonly as small as five or ten bytes, then most of the cross-net data will be control information. The BM option is intended as a simple data compression technique, to remove this overhead from the communication channel.

5. Description of the option

The option is enabled through the standard Telnet Option negotiation process. Afterwards, the SENDER of data (the side which sends the IAC WILL BM) is free to define and use mappings between single and replacement NVT characters. Except for the ability to refuse particular definitions, the receiver of data has no control over the definition and use of mappings.

The sender (of the WILL BM) is prohibited from using or redefining a <macro byte> until it has received an <ACCEPT> <REFUSE>, or DONT BM, in reply to a <DEFINE>.

NOTE: The Telnet command character IAC (decimal 255) may be a member of a <replacement string> but is the ONLY character which may NOT be defined as a <macro byte>.

Within any Telnet command (i.e., any sequence beginning with IAC) macro replacement may NOT take place. Data are to be interpreted only as their normal character values. This avoids the problem of distinguishing between a character which is to be taken as a <macro byte>, and interpreted as its corresponding <replacement string>, and one which is to be taken as its usual Telnet NVT value. In all other cases, however, <macro byte>s are to be interpreted immediately, as if their corresponding <replacement string>s had actually been sent across the network. Expanded strings are not subject to reinterpretation, so that recursive definitions cannot be made. Telnet commands may be included in <replacement strings>; however, they must be totally contained within the macro or must begin within the macro and terminate outside of it. In particular, they may NOT begin outside a macro and continue or terminate inside one, since no macro replacement takes place while processing any Telnet command.

Note that when skipping data due to Telnet SYNCH (INS/DM) processing, BM macro replacement should still take place, since (for example) "IAC DM" would be a valid <replacement string>.

The <count> in the <DEFINE> subcommand is intended to allow the receiver to allocate storage. IAC interpretation is not over-ridden during BM subcommands so that IAC SE will continue to safely terminate malformed subcommands.

The BM option is notably inefficient with regard to problems during <macro byte> definition and use of <macro byte>s as real data. It is expected that relatively few <macro byte>s will be defined and that they will represent relatively short strings. Since the Telnet data space between decimal 128 and decimal 254 is not normally used, except by implementations employing the original (obsolete) Telnet protocol, it is recommended that <macro byte>s normally be drawn from that pool.

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Summary of Bell Canada Study on Computer Mail

Chapter 1

INTRODUCTION, EXECUTIVE SUMMARY, AND RECOMMENDATIONS

1

THE MARKET FOR COMPUTER MAIL

2

Electronic mail is a billion dollar market in Canada and the United States. Last year, businesses spent $280 million on Telex and TWX.* They also spent between $500 million and $1 billion on TWX-like systems for intracompany communication ("private wire" systems).** Facsimile revenues were at least $100 million. 3

*Quantitate estimates in this chapter are derived elsewhere in the report. 3a

**In Canada, high long-distance telephone charges and regulatory limitations have so far stunted the development of private-wire and facsimile networks. 3b

Electronic mail is growing rapidly. Telex, TWX and

private-wire networks are all well-established and have healthy growth rates, despite competition, in the United States at least, from new forms of electronic mail. Facsimile's growth can only be described as explosive. Changes in hardware and regulation have transformed facsimile from a specialized service in 1970 into a mainline electronic mail service, whose terminal base already exceeds the number of Telex and TWX terminals. Within a decade, facsimile may virtually replace traditional private-wire networks . Growing at an even faster rate are the new communicating word processing typewriters. Although communicating typewriters appeared only three years ago, over 24,000 have already been sold. In comparison, there are only about 150,000 Telex and TWX terminals in Canada and the United States. 4

Consumers appear to be very sensitive to price. Although Telex and TWX have grown despite prices averaging more than $2.00 per message, lower cost facsimile and private wire networks are stripping the market for short messages in the United States and could do so in Canada as well, if regulations change. Communicating typewriters, in turn, are building a new market for the transmission of long documents. 5

But even "lower-cost" services are not cheap, averaging perhaps $1.00 per message for facsimile and not much less for most private-wire systems. This raises an interesting

question. If a billion dollar market can be built at $1.00 to $2.00 per message, what might the market be for either a very cheap communication service, costing $0.25 per message, or for a sophisticated service, costing between $0.50 and $2.00 per message (but providing extra tools for message processing, including text-editing, filing and retrieval, and so on?) We suspect that both services could make a strong run at the $1 billion electronic mail market, perhaps increasing the size of the market many fold. 6

This is not an idle question. Both services exist, or, more accurately, represent service extremes of an experimental medium called "computer mail." While the costs we have quoted are lower than the costs of current computer mail systems, such costs can be attained, as discussed below, fairly soon. Computer mail has evolved primarily among U.S. military computer science researchers, where it has reached a rather high state of development. But poor ties between that research community and industry, coupled with the threat of regulatory backlash, have so far kept computer mail nearly invisible. But now that such prominent users as U.S. President Jimmy Carter have tried computer mail, the existence of this fairly mature medium should not remain a secret much longer. In fact, TYMNET (a large computer transmission network in the United States)

has just launched a commercial mail system, ONTYM, which can probably deliver messages for $0.50 to $0.75 apiece. 7

The capabilities of advanced computer mail systems are difficult to explain abstractly. To give the reader some feeling for this new service, we include the following scenario, taken from a recent paper by the author, "The Outlook for Computer Mail," which is to be published in the Journal of Telecommunications Policy. 8

> A good way to describe computer mail is to give a scenario for its use. I will try to do this with a hypothetical session that exemplifies my personal experiences with computer mail. Before beginning, let me point out that I use computer mail myself, without going through a secretary. This is not typical, nor is it atypical. Use of computer mail is highly idiosyncratic, and it is impossible to tell, on the basis of a person's experience with computers or their organizational level, how a given individual will adjust to computer mail. The following scenario considers a person using the system directly, first, because this is probably the most cost-effective way to use computer mail in an informal environment, second, because this illustrates the full power of the medium, and third, because that is how I personally use it. 8a
>
> The hardest part of using computer mail is the still-clumsy process of "logging in" to the computer. This is a two- or three-minute ordeal, in which I dial the comuter network, tell it what kind of terminal I have, tell it what computer I want, tell the computer who I am, and tell the computer that I want to read my mail. This process undoubtedly will be simplified over time, but it is currently a major impediment to system use. 8b
>
> Once the computer understands me, it tells me if I have new mail. If I do, it gives me a one or two line summary of each message, including author, date, and

subject. I usually get about two messages per day, but to illustrate the process, I will assume I have received five. 8c

The first message is electronic junk mail: a weekly progress report for a project loosely related to mine. It is sent to me as a courtesy, and I normally delete it immediately. But every now and then, like today, I want to scan it. Since it is three pages long, I tell the system to list it. It appears a few minutes later on a high-speed printer, and I will scan it at my leisure. 8d

The second message is from Ted Myer, a mail system designer at Bolt, Beranek and Newman, in Cambridge, Massachusetts. He tells me that he will visit SRI next wednesday and asks if we can get together. I type the "answer" command, then type a short reply. It is delivered to him immediately. I send a message to my calendar file, noting that I will be meeting with him, and I tell the calendar to notify me the day before he arrives. 8e

My third message is from the calendar, reminding me that today is my wife's birthday, that I have reservations for dinner, and that I should call the florist. Many uses of computer mail are as informal and personal as this one. Also, the fact that the computer sends me a message is not at all atypical. The calendar system sends messages all the time, the monitor informs me now and then that one of my old files has been archived onto tape, and so on. I usually send replies, thanking the particular subsystem. So far, this does not appear to have harmed the computer. 8f

The fourth message is from Jim Carlisle at USC. Jim has broadcast this message to fifty people around the country, telling them that a new paper on computer mail is available. If I want it immediately, I must go through a complicated process to ship it across the network to my computer. Sadly, few systems can handle long documents effectively. Because the paper is not urgent, I send a brief reply, asking him to mail a copy. Then, with a single command, I foreward a copy of the message to a third party, who might be interested in Jim's paper. 8g

The fifth and last message responds to an inquiry I broadcast last week to several colleagues on the ARPANET, asking them when various mail systems became operational and who developed them. This form of "inverse research," to quote Ken Pogran of MIT, was actually used to write this paper. The sender of this message is someone I have never met before. From the ARPANET directory, I find that he is with the University of Wisconsin. After I send a brief on-line reply, I jot down his telephone number and plan to give him a call tomorrow. Like several other people I have met through computer mail, he may become a close colleague in the future. 8h

I have now finished responding to the messages sent to me today. I also wish to send a message to Larry Day, of Bell Canada. I give the command, "send" and the computer asks me to whom the message will be sent. I type the name "Day," but because there are many Day's on the system, the computer types out a short list of people named Day, giving their full names, their organizational affiliations, and identifiers that functions much like telephone numbers. I type in Larry's identifier. The system should be able to recognize the name "Larry Day" or even "Day" more easily, since we are frequent correspondents, but it cannot. The specification of recipients usually ranks next to logging in as the least humanized part of any computer mail system. The system asks me if I want copies sent to anyone, and asks me to supply a brief title. The system then lets me type the message and edit it. (Alternatively, I could can specify a pre-typed document for transmission.) Overall, the process is very much like filling out a memorandum. I re-read the message, then transmit it. Because the message is not urgent, I queue it for overnight delivery. 8i

It occurs to me that Jim Carlisle of U.S.C. asked a question last week and that I could not reply immediately. I have the system scan through all messages from Carlisle. The system prints a header for each Carlisle message, including the date and subject. I stop the printing when I see the message I want, then type it out and reply to it. I also tell the system to send a copy of the message to another friend, who is not a computer mail user. The system prints a copy of the message on the high-speed printer, together with a mailing label. My secretary puts it in the afternoon mail. 8j

> My session is now over. I have spent 12 minutes on-line, and I have sent sent two messages. The average message was about 50 words. Counting copies sent to people other than the primary receiver, I sent each message to three people. these averages are reasonably typical of the experiences of most users. 8k

Computer mail costs are not cheap today, but even now they are competitive with alternatives. A system of medium sophistication, for example, now costs about $1.70 per message yet does far more than Telex, TWX, or facsimile--actually automating composition, filing, and other message handling processes, as well as handling transmission. 9

Even if current costs were higher (and they are, on many systems), the outlook for future costs would still make computer mail an extremeley attractive investment opportunity. The service that now costs $1.70 per message could probably be redesigned today to cost $0.40 per message, without changing its capabilities. By 1985, the same system should cost $0.30. Even the most expensive computer mail system on the market today, at $9.79 per message, should cost only $0.84 per message by 1985 and may be much cheaper, since the current system is unoptimized and has an atypical user population. One very simple computer mail system, which replaced a private-wire network in one company, already costs about $0.25 per message. 10

Potential opportunities for market expansion are enormous. At a rough average cost of $1.00 per message, existing

electronic mail systems in Canada and the United States handle more than one or two billion messages annually. Yet we estimate that 600 billion pages of written communication flow each year within and among organizations in those two countries (See Table 1). Moreover, computer mail moves communication vendors into the businness of PROCESSING paperwork; while telephone bills run only 0.5% to 1.5% of a given company's revenues, the processing of paperwork requires 30% of all labor hours in a typical corporation. There is some evidence that computer mail can compete for some current telephone uses (a $40 billion market in Canada and the United States) and into face-to-face communication (which accounts for 25% to 50% of the day of a typical office worker. 11

Overall, while computer mail's market potential is highly uncertain, it is large under almost any assumptions one can make. 12

COMPUTER MAIL AND BELL CANADA 13

For a number of reasons, we believe that computer mail is among the most attractive new business opportunities facing Bell Canada. 14

> In Canada, if computer mail were offered in conjunction with Bell Canada's packet network, computer mail could expand corporate revenues and do this rather quickly.

Indeed, computer mail is among the few business opportunities that could impact the future revenues of Bell Canada, the country's largest industrial enterprise. 14a

Bell Canada could enter the much larger U.S. market at the same time it enters the Canadian market. It revenues in this market could equal total Telex, TWX, facsimile, and private-wire revenues in the United States, this would equal a third of Bell Canada's current revenues. And, as noted above, the marketplace could be considerably larger. 14b

Computer mail is a communiction service, which Bell Canada could offer without sharp disruption of its internal management. In addition, Bell Canada's credibility in the United States is already high in the communications market. 14c

Competition should be manageable, if Bell Canada moves quickly. AT&T is definitely not contemplating computer mail yet at the corporate level. Xerox seems likely to delay entering the market, IBM, in our opinion, is entering the general electronic mail market at a comparatively modest level, and they are doing so ineptly. There is likely to be only one major competitor immediately: TYMNET, which is already offering an attractive computer mail service, ONTYM. However, competition from this system should not be decisive. While competition does exist, it is far, far lower than Bell Canada could normally expect in a market of this size. 14d

Finally, computer mail may prove to be the cement needed to integrate office automation systems, if Bell Canada eventually chooses to enter that marketplace. The dominant trend in office automation systems today is to offer communication tools that tie information processing systems together. Moreover, as noted above, computer mail is a processing system, not a transmission system. In the forms-processing submarket, which, according to Table 1 is potentially much larger than the correspondence market, processing is an open-ended function and can be upgraded gradually to embrace what now seems to be the heartland of office automation -- forms processing and information automation. 14e

THIS STUDY

15

This is a small study, less than six person-months in size. In such a limited effort, it was necessary to pick objectives very carefully. Some attractive study alternatives were a detailed cost analysis, initial design-oriented research, and a variety of types of market research. But one consideration proved decisive: a strong suspicion that current computer mail designs were missing the main communication needs of organizations , and so evolving in directions thatcould lead the vendors of existing systems into an evolutionary cul-du-sac.

16

Accordingly, we settled upon a single objective: to identify, at a high level, the major functions computer mail systems must offer to fit organizational communication needs. Two secondary objectives were treated slightly: to produce a superficial cost analysis and to identify some major considerations Bell Canada should observe before entering the market.

17

Traditionally, computer mail systems have been built by a process called "bootstrapping." This means that a computer programmer designed a system to fit his or her needs, plus his or her stereotype of the needs of other office workers.

Practical experience brought minor alterations and, sometimes, major design insights. 18

Bootstrapping's major strength is that it can enter a marketplace with a radically new product even when user needs are poorly known, then learn to understand possibilities through practical experience. Bootstrapping can produce the indisputable wisdom of first-hand experience. But bootstrapping has also tended toward a fatal weakness: a tendency to miss the mainstream of a market, simply by using unrepresentative users or by failing to learn from users. 19

Computer mail systems have universally been designed through bootstrapping. This has produced a rather restricted focus, with virtually all designs falling into three schools: ARPANET computer mail, computer conferencing, and commercial mailbox services. No system has ever been built on the basis of studies of general user needs in a corporate or governmental organization. 20

In this study, SRI has attempted to take advantage of both bootstrapping and existing behavioral studies of organizational communications. First, we surveyed all significant computer mail systems, to identify major design innovations, major existing problems, and unanticipated patterns of user behavior discovered during tests. While detailed analysis would have

fallen outside the scope of our study, major hypotheses were raised and, where possible, substantiated. 21

Second, we examined existing research on organizational communication, to illuminate existing written communication patterns and needs in organizations. We were forced to stay at a high level, focusing primarily on gross traffic statistics like those shown in Table 1. Even these statistics, as discussed below, were sufficient to indicate that current computer mail systems are aimed at small segments of the potential computer mail market. We also surveyed other behavioral literature, to raise hypotheses that should be addressed in more detailed future studies. 22

CONCLUSIONS 23

These are our major conclusions from the survey of behavioral research: 24

> The vast bulk of all message costs are handling costs, not transmission costs: 30% of all labor hours in a typical organization are devoted to message processing, and between 70% and 90% of the cost of any message comes from user's labor. By concentrating on message processing, Bell Canada could build a market much larger than the current transmissson market. 24a

> Business and government communication is dominated by forms flows, even more than Table 1 indicates. In addition, forms processing is a large, attractive market. Existing computer mail systems have largely ignored

forms, despite the fact that forms have traditionally dominated the use of other electronic media, such as facsimile or private-wire networks. Concentrating on forms should give Bell Canada a large competitive advantage. 24b

Most written communication flow takes place within offices, not between them. Computer mail systems now in use follow this pattern, making computer mail the first electronic medium to enter the very large intraoffice communication market (see Table 1). Yet to date system designers have largely ignored the changes in system architecture needed to exploit this usage pattern. 24c

Although most written messages in organizations are very brief, a substantial number are multipage transmissions. In fact, roughly 40% of all transmissions are two or more pages and, more importantly, multipage transmissions account for over 70% of all page-transmissions. In addition, longer messages generally require greater handling, including more intense editing, pre-release clearance, and so on. Only one computer mail system can now handle long documents. Its average transmission is around three pages, while the average transmission in other systems (which cannot handle long items well) lies between 50 and 150 words. Similarly, it appears that many office transmissions, such as memoranda, are broadcast to all office members; in fact, broadcasting appears to account for the bulk of all pages transmitted. Again, most existing systems are poor at broadcasting. Overall message size limitations in current system designs, and, in most cases, an inability to handle broadcasting, seem to exclude over 70% of normal message traffic. 24d

Computer mail systems generally assume informal message flows (memoranda, letters, or, at most, forms). But a substantial and growing percentage of all business communication is formal, reflecting the growing complexity and coordination needs of modern organizations. Formal communications includes action-required memoranda, periodic progress reports, continuously-updated manuals, PERT and CPM reports, input to management or project information systems, and so on. Since formal, controlled communication tends to have high

time value, even early computer mail systems should aim at this market segment. 24e

Our analysis of bootstrapped systems also proved interesting, revealing a number of developments that should be incorporated in future systems. 25

Existing computer mail designs embody a large number of excellent design concepts that make them highly acceptable to most users -- apparently even managers, who have historically resisted the use of computer bse systems. Future systems should exploit current design wisdom. 25a

Users' need for sophistication in computer mail seems to be directly proportional to their daily message volume. When users receive more than two or three messages daily, they begin to request special reading and filing tools. Users have also demanded ancillary tools such as text editing and the computer mail analog of telephone directory assistance. There is much controversy over the need for more exotic tools, such as automatic right justification, automatic spelling correction, and similar tools. While the more exotic "bells and whistles" may seem frivolous, they represent too large an incremental market to ignore completely. In addition, many attractive features such as automatic right justification can probably be offered at nearly zero incremental cost. 25b

There have been a few limited but very interesting analyses of forms needs by advanced computer mail designers--enough to point to several new areas of research. For example, automated "form fill-in" may be far less important than "form task recognition," i.e., letting the system take the initiative in determining when a form should be completed or even in automatically generating and sending appropriate forms to users when some event occurs. 25c

Most computer and communication costs come in the text composition phase and in the message reading/filing phase, not in the transmission phase. If processing is

placed near the user, in an intelligent terminal or small computer, then communication costs would be slashed and processing costs could also be reduced, especially if the mail computer is "prodified" for unattended operation. Some progress is being made in this area. There are also efforts to let computer mail systems accept input from communicating typewriters or even Telex or TWX machines, thus mating the processing power of computer mail with the economic advantages of prior preparation. 25d

Certain design concepts suggest that, in the end, existing computer mail functions may be adopted as the control functions for all forms of electronic mail, including facsimile and perhaps even digitized voice. 25e

Computer mail systems are most useful when they are interfaced to postal mail or other forms of electronic mail, even if only for output. This allows nonusers to be reached by the system. 25f

Many problems arise when the user community increases above several hundred people or begins to link users on several computers. Some of these problems have been studied, others only identified. 25g

In Table 1, communication within a person's own office space was not estimated. Yet people are constantly making notes to themselves, handling appointments, retrieving old correspondence from files, and so on. Some of these functions have been addressed with calendar/appointment systems, although designers have only begun to work in this area. Yet it may be that the market for appointment/calendar uses and other "personal" services will far exceed the market intercompany and even interoffice correspondence. 25h

Experience with one system, FORUM/PLANET, indicates that users may consume twice as many resources when using the system free as when their organization pays for use. To date, few individuals (as opposed to organizations) have ever paid directly for use, and if this happens, even more thrifty use patterns could emerge. One must be cautious when extrapolating future use patterns from current experience. Studies of the perennial tension

between users' desires and service price will be critical to the creation of effective computer mail design. 25i

Although it was not an objective of this study to consider "system architecture" -- that is, what kinds of computers are used, how many of each are used, how they are networked, which computer provides which service, and so on -- several of our incidental findings about system architecture proved important. 26

Most computer mail systems are now offered only on large computers that the customer must reach through some data transmission network. This is a very expensive way to provide message service. If traffic volumes are high enough, it would be better to place small computers on customer premises, to handle most processing before and after message transmission. This would slash communication costs, and it would also lower computer-associated costs. Our demand assessment indicates that there will be more than enough traffic to justify the use of local computers for most customers. For remaining customers, however, network service computers will be necessary, either until their traffic builds sufficiently to justify local computer service, or if their volume perpetually remains too small for local service. Of course there must always be network switching computers. 26a

In facsimile, Telex, TWX, and private-wire services, work stations are usually classified as either "convenience" or "production" (also known as "mailroom") stations. Convenience stations handle few messages -- between one and ten a day. Production stations, in contrast, handle dozens or hundreds of messages daily. While convenience stations are usually located near users, production stations are usually centralized. Most computer mail systems are designed either for convenience use (e.g., HERMES) or for production use (e.g., Hewlett-Packard's COMSYS), but not for both. Future computer mail systems can and should support both kinds of stations in an integrated manner, since the cost of integrating the two types of service will be low, and most firms will need a mixture of the two. 26b

> Computer mail systems vary greatly in capabilities and cost. In some, the user simply composes, the message, edits it lightly or not at all, sends it, and has it printed (once) at the receiver's end. These systems offer little more than Telex or TWX, but they are easier to use and cost less. In other systems, the user has powerful tools for such processes as text-editing and message filing and retrieval. These systems are expensive, although by reducing user's labor, they can potentially justify their much higher price tags. On most ARPANET computers, the user can choose from among several simple and complex mail systems, selecting the one best suited to his or her needs at any particular moment. Future systems should follow this precedent, perhaps even allowing managers to "lock out" either simple or complex systems, depending on his or her philosophy of productivity and cost control. 26c

All of these findings (and others discussed in the body of the report) are important, but three stand out as major guiding principles that competitors may miss. 27

First, computer mail is practically and theoretically a communication PROCESSING service, not a TRANSMISSION service. Transmission costs will at best be a few cents out of a total price ranging from $1 or more today to $0.25 in 1985. Moreover, computer mail can be used to process other types of electronic mail transmission, including communicating typewriters, facsimile and next-generation Telex/TWX systems. 28

Second, forms transmission and processing is likely to be the big market for computer mail, just as forms transmission now dominates facsimile and teletypewriter network use. Forms transmission and processing is not a simple matter, and Bell

Canada could gain a major advantage over competitors by an efficient integration of forms into its computer mail designs. 29

Third, no existing computer mail design seems suitable for mere grafting onto a packet-switched network as an immediate offering. Yet several might be acceptable as test systems or first-generation systems with moderate levels of recoding that could be completed reasonably quickly. 30

RECOMMENDATIONS: GETTING INTO THE MARKET 31

Three things will be essential for success if Bell Canada enters the computer mail market: rapid action, long-term committment of substantial development funds, and a proper understanding of the market. All are essential. The last, understanding the market, could be Bell Canada's trump card in the competitive market place. 32

To move rapidly, Bell Canada must conduct a number of parallel development efforts, as illustrated in Figure 1. This strategy is based on the assumption that Bell Canada must enter the marketplace quickly, with a system that can satisfy initial users, then grow in system evolution faster than competitors as the marketplace matures. A "wait-and-see" or "wait-until-we-get-a-good-system" attitude could let competitors gain momentum in this market. This could be

disastrous, first because users tend to develop loyalties toward the first system they learn, and second because the attractiveness of a service grows rapidly as the size of its user community grows. 33

Development of a first-generation system (actually the modification of an existing system) should begin immediately, on a contract basis. In-house development would take two or three years, which is far too long. At some point, control should be shifted in-house, or the contract research group should be absorbed. Since many strategies for the external-internal transfer are possible, our analysis will ignore the distinctions based on who does the actual work. 34

As soon as the conceptual team finishes the basic design changes on the first system, it should produce a family of three new systems: one very simple like TWX, one as sophisticated as ARPANET computer mail, and one somewhere in between. One and perhaps two of these designs will probably find no market, but the penalties for guessing wrong if only one system is built and proves to be wrong are enormous. Market research will not be able to preselect a single design for two reasons: first, initial market research cannot be accurate enough; second, it will be impossible to estimate costs before actual construction with an accuracy anywhere near sufficient for the needs of marketing researchers. 35

As soon as the concept team begins to work on the first system design, a systems* team will begin to work on the three second-generation systems. They must begin as soon as possible because there are three major system-level problems that must be addressed in considerable detail. First, the use of on-customer-premises minicomputers will be essential to cost-effectiveness, and it will take some time to design the necessary software. Second, problems associated with the design of systems for large numbers of users must be faced and overcome. Third, an adequate forms system capable of later upgrading must be designed. 36

*We define "systems" work in contrast to "user-level" work. User-level work involves the user interface to the system. Systems work entails labors in the elaborate "guts" of the hardware and software, including the writing of background processes, protocols for multi-host communication, and so on. 36a

Because of the importance of forms and the lack of good software for forms proccessing, a forms conception-design team should be formed to work in parallel with all other efforts. It will provide some input for the first system, more for the second generation family, and even more for a third generation family that will adequately address the forms-processing issue. 37

A marketing research team will work in parallel with other teams, conducting timely research and interacting with the design team extensively. 38

At first, time pressures will force designers to work by dead reckoning (based on our analysis, and current design trends) and unconfirmed hypotheses on which some ad hoc research is done. But the role of the marketing research team will gradually evolve from ad hoc topical research, to market pre-testing and feedback testing, and gradually to deep input to designers. The marketing research staff must develop a detailed internal analysis of work flows. 39

A small technological forecasting contingent should work in parallel with other teams, identifying important technology/cost trends and advising the other teams. Engineers are not necessarily needed here; it is more important that members of this team 1) understand the total cost of a service, especially labor costs, 2) understand pricing, and 3) keep their focus on critical cost elements, especially terminals and storage, instead of looking at the most volatile technology. 40

One important thing to note is that system construction should be separated into three teams: conception, coding and development, and production programming. The separation of conception from coding and development is artificial, a response to time pressures. But the use of a separate production programming team is essential to ensure that only finished products reach users. 41

Whether this or some other operational plan is adopted, one thing is clear: some accelerated development strategy is mandatory. Ordinary development processes, which would take two or three years to produce any product, would probably leave Bell Canada out in the cold. Design is on the critical path in all of this, and a fair amount of dead reckoning will be needed to put out designs quickly. Furthermore, a very tightly controlled marketing research effort will be needed if marketing researchers are to feed the design team with timely information. 42

TOPS20 DIFFERENCES

TENEX and TOPS-20 EXEC DIFFERENCES (Architect distribution)

The following table lists changes of importance to NLS users; it is followed by comments. It is not a complete guide to the architectural, structural, and other changes which affect programming. It is a list of the changes that affect the average user as far as we know. In the table, CTRL means hold down the control key while you type the specified character; upper case represents what you type; numbers in parentheses refer to notes in this document; and lower case represents comments.

TENEX	:TOPS-20 :
CTRL A (backspace character)	a CTRL A is entered as text
DEL or <delete> key(2)	backspace character
CTRL O (stop processing)	1st CTRL O discards terminal output while still processing(3) 2nd CTRL O resumes output
CTRL Q (backspace line)(4)	continue typeout if frozen when in "page mode"(3)
(start/stop typeout)(4)	CTRL_ (1st stops/2nd starts typeout)
CTRL R (reprint line)	same
CTRL S (retype sndmsg)	CTRL E (in SNDMSG)
CTRL T (status-type twice)	CTRL T status (type once)(5)
CTRL U (nothing)	CTRL U backspaces a line
CTRL W (backspace word)	same (nothing echoed)
CTRL X (delete input)	nothing
; (comment)	same*
! (nothing)	comment, same as ;
; (in filename)	changed to period
filename.extension;version	filename.type.generation
(username)filename.PC;1	$username$filename.PC.1
BATCH program	SUBMIT filename (command)*
CHANGE PASSWORD	SET PASSWORD*
DSKSTAT (disk space)	INFO DISK (separate command words)
LINK username	TALK username

LIST lpt: or tty:	COPY lpt: or tty:(6)
PROTECTION filename...	SET FILE PROTECTION
QUIT (leave Tenex)	POP leave Exec
	[QU lists a program status!]
TERMINAL SCOPE...	TERMINAL PAGE #lines
	CTRL O prints next page
	TERMINAL NO PAGE
	TERMINAL WIDTH #columns
WHERE (is) user	SYSTAT username(7)
"not logged in"	nothing is shown (1)

*On SRI's KL -- other TOPS-20 systems may be different.

General Comments and Notes

(1) As you use TOPS-20 many differences will be noticed. However, these are mostly on the level of wording and semantics, and won't significantly affect what you do. For example, you will see "YOU HAVE NEW MAIL - FROM USERNAME" ; when you GO to TENEX from NLS (note you really are going to TOPS-20) it will say "TOPS-20 Command Processor"; when you try to access a file you are not permitted to, you will see "illegal to change specified bits"; if you do SYSTAT USERNAME and she is not logged in, the response will be nothing; instead of ? TOPS-20 says "eh?"; and so on. Most likely there will be some things that do make a difference that we haven't found yet or are working on. In any case, just send your discovery to FEEDBACK and we'll fix it or announce it as appropriate.

As in TENEX, typing a ? gives a list of all possible EXEC commands. Typing a ? for a subcommand or second keyword of a command will list the possible alternatives. Also, as in TENEX, command recognition and filename recognition is done when an <ESCAPE> is typed.

There is also a fairly well developed HELP command. If the command HELP is followed by a word then a search will be made for information about that word if it known to TOPS-20. Upon last look, there were 100 topics available in HELP.

(2) Notice that DEL or <delete> key does not properly delete control characters typed in EXEC commands, and of course it will not abort your current command since it is a backspace.

(3) When the terminal is in PAGE mode [by using TERMINAL PAGE command], and it pauses and rings the bell, typing any character will NOT continue the typeout, only typing a CTRL Q will. When in PAGE mode, typing a CTRL S will freeze the output; it can be

continued by typing CTRL Q.

(4) Paged mode will not work in NLS because it requires the use of CTRL Q, which is reserved for Help. Since paged mode is turned off by NLS, it will not be available after NLS is called. However, this will not cause difficulty since the CTRL _ (backarrow key) to stop typeout can be used at any time in Exec, DNLS, TNLS, or whatever without using the command TERMINAL PAGE.

(5) CTRL T will give the same information as at Office-1 when it is implemented in the very near future.

(6) The TYPE and LIST commands do not produce headers and page numbers as in TENEX. They are forms of the COPY command.

(7) The SYSTAT command can take several arguments that you type after the command, for example: a directory name, a job number (. means self), and the word ALL. They may be used in combination with each other.

Unlike TENEX, all EXEC commands require a <CR> for termination whether or not an <ESCAPE> key is typed.

Some Additional Command Changes

The TOPS-20 command INFORMATION (ABOUT) takes the place of the following TENEX commands:

AVAILABLE	JOBSTAT
DSKSTAT	MEMSTAT
FILSTAT	TRMSTAT
FORKSTAT	

It also provides additional information. Type a ? for a keyword to see what all of the possibilities are.

The * can be used as part of a filename, extension, or generation. E.g. the filename <BAIR>TENEX-DIFFERENCES.NLS.4 could be written <B*>TEN*.N*.*. This would also find <BAIR>TENEX-COMMANDS.NLS;23.

The DELETE, UNDELETE, and RENAME commands default to all versions when file recognition is done, not to the lowest or highest version. The DELETE command can take a subcommand, KEEP n, where n is the number of versions to keep. NOTE: this makes it very easy to delete more files than you intend--they can be retrieved by using UNDELETE before you logout.

The TOPS-20 command TERMINAL (mode is) sets the terminal parameters and takes the place of the separate terminal commands in TENEX as indicated in the table.

TOPS-20 includes a new feature to read a file of EXEC commands to be executed at login time. Set up a file named LOGIN.CMD with the commands desired at login. Use the same procedure as you would for a runfile in Tenex.

For example, if you wanted lowercase input and output, a page width of 79 characters, and page mode with pausing every 24 lines (remember the continue character is CTRL Q), your file named, LOGIN.CMD, would include the following EXEC commands:

```
TERM LOWERCASE
TERM NO RAISE
TERM WIDTH 79
TERM PAGE 24
```

There are five additional directory commands, including: FDIR, TDIR and VDIR. They respectivily give everything about a file ("Full"), Times of read, write, etc., and a shortened listing that includes size. (The others are RDIR and WDIR.)

Short Introductory Tutorial

There's a 5 page introduction to TOPS-20 in <DOCUMENTATION>TOPS20.TUT for beginners (provided by DEC?).

Programming Support Commands [for programmers only]

Note that, usually, when creating a .SAV file, the extension will default to .EXE, which is the standard extension for a .SAV file in TOPS-20.

The CCL program does not exist in TOPS-20; the commands it takes are now accepted directly by the EXEC. But notice that the system programs called to execute these commands are in general not the same as in TENEX. For example, the LOAD and EXECUTE commands use LINK as the loader, not LOADER. These commands will accept indirect files in place of file specifications as in TENEX.

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SRI-KL SRI-KL SRI-KL SRI-KL SRI-KL SRI-KL SRI-KL SRI-KL SRI-KL
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Saturday, July 9, 1977 16:15:32 Saturday, July 9, 1977 16:15:32 Saturday, Ju
Saturday, July 9, 1977 16:15:32 Saturday, July 9, 1977 16:15:32 Saturday, Ju
Saturday, July 9, 1977 16:15:32 Saturday, July 9, 1977 16:15:32 Saturday, Ju

SAMPLE USE OF NLS
BY HAL BAMFORD,
KWAC member

< FJOURNAL, 40410.NLS;1, >, 21-MAY-77 07:34 XXX ;;;; .HJOURNAL="HEB2 21-MAY-77 06:39 40410"; Title: .H1="c77-03"; Author(s): Harold E. Bamford/HEB2; Sub-Collections: NIC; Clerk: HEB2; .IGD=0; .SNF=HJRM; .RM=HJRM-7; .PN=-1; .YBS=1; .PES;

AMS2:

c77-03-31

routine

Mary Mellette

Donald Jackson (DFA) didn't like the travel authorization. He said that I didn't request enough money per diem. I typed on the authorization that Dr. Bamford was going to Palo Alto. That seemed to satisfy him.

c77-03-30

worked on odds and ends

c77-03-29

Stan Gregory

gave him a 20 minute demonstration on my part of NLS. This was before his meeting with Dr. Bamford. He seemed quite interested.

added more to index

c77-03-28

Dan Hawkins

talked to him twice. I ordered more tapes and a daisey wheel last Thursday. They never came. He said the messenger delivered them. I tracked them down and found them in Room 1208.

c77-03-25

routine

c77-03-24

Letter to Mary Fran Buehler*

(DJOURNAL, 39506, 1:w)

Division Of Science Information
Ms. Mary Fran Buehler
Technical Information
Documentation Division
Jet Propulsion Lab
Cal Tech
4800 Oak Grove Drive
Pasadena, CA 91103

Dear Ms. Beuhler:

Could you please send a copy of the booklet "THE LEVELS OF EDIT" that was mentioned in the Association for Scientific Journals Newsletter of March 1977.

Please send it to the following address:

Sarah N. Rhodes
Assistant Program Director
Access Improvement Program
National Science Foundation
1800 G Street, NW
Room 1201
Washington, DC 20550

Thank you very much for you assistance.

Sincerely yours,

Anita M. Stoltz, Secretary

Access Improvement Program
sent Dr. Moore (NSF) copies of CSG project summary for C-950
ordered more daisey wheels and tapes for Qualterm
c77-03-23
Dr. Bamford
Discussed a better procedure for indexing.
Put new list into EIE/Addresses
c77-03-22
DSI Staff meeting
held a meeting in Dr. Burchinal's office re: 3:00 meeting with Dr. Averch
made copies of AAAS paper and sent them to people who had requested them.
Meeting with Dr. Averch
Program Directors gave brief description of their program and their main purpose and functions.
worked on EIE/Addresses
c77-03-21
routine
c77-03-18
Forgot Sarah's travel tickets. Sorry for the inconvenience!
c77-03-17
3 hours Annual Leave
c77-03-16
Dr. Bamford and I had problems all day with over allocation
c77-03-15
worked hard
c77-03-14
routine
c77-03-11
Donald Jackson, DFA
had not received Paul's travel authorization amendment for rental car. Had to go down there, find it, and walk it through.
c77-03-10
routine
met Dave Staiger for the first time
c77-03-09
8 hours Sick Leave
c77-03-08
routine
c77-03-07
TIP down most of the day. Used NBS TIP
Mr. J.W. Huston
sent him copies of EIE, DSI summary of wards and guidelines per our conversation
c77-03-04
Lunch
with Bill and Judith Ennis of NJIT
c77-03-03
worked on some rush items for Dr. Cima
2 hours Annual Leave
c77-03-02
Paul Custer
spent most of the day looking for the journal reference for the SRI proposal items that I sent him the first time the jacket

was done.
c77-03-01
routine
HEB2:
c77-03-31
Program Review
with Dr. Cima in attendance we completed this exercise. A sharp disagreement developed over whether we were "absolutely limited in our thinking" to electrodigital technology or had deliberately concentrated our efforts on the most promising alternative to paper-based communication. Dr. Burchinal feels that at least the DSI program as a whole must cover all possibilities. I respectfully disagreed, on the grounds that the program's resources are dissipated by such a strategy.
Mr. Howerton (Lawrence Livermore)
A talk on banking of physical data (Cf. p00761). Dr. Burchinal, Mr. Lee, and Dr. Weiss attended.
STI Inventory
I sat in on the opening of this project's first Advisory Committee meeting.
Mr. Carlile, Mr. Custer, and Mrs. Rhodes
Lunch, and an idea for an anthropological study of our communication behavior. I encouraged a research proposal. I also encouraged Carlile to explore with Brownstein the possibility of a jointly funded project to evaluate DARCOM's use of NLS, using before and after observations.
Mr. Custer
My concept for upgrading our indexing system.
Dr. Savin and Dr. Cima
We agreed that I should encourage a proposal from ACR.
c77-03-30
Message to Mr. Norton and Dr. Lieberman
I would like to meet with you on April 6 to discuss the following topics, as well as any others you may propose:
Jim--
Your presentation to the Task Force on Thursday.
Status of funding for 1977.
Conversion of Innovation Survey to NLS. <.d:w1>
Dr. Savin, Mr. Custer, and I met with Mr. Creager, Mr. Strawhorn, and Mr. Hawkins at the CSG offices in Rockville.
We began by setting aside the questions of whether to use NLS for the RAND project and whether SRI's not-for-profit and non-taxpaying status would present an obstacle to conversion of the Innovation Survey project to NLS.
Technical issues:
Conversion of Word/1 files
feasibility
cost
NLS capabilities for output processing
Underlining--this would be extremely desirable but not absolutely critical at a terminal.
Typesetting
scientific characters
full-page make-up

turnaround time
magnetic tape for local printer
costs
Access to local high-speed printer
CRU requirement for project operations. Hawkins will provide quantitative data on past computer usage in project.
In discussing these issues with Jim Norton my objective will be not only to obtain the answers but to obtain them in the form of a definitive proposal.
The proposed effective date will have to be left blank (it would be later than April and earlier than August in all probability), since CSG's present contract status precludes establishment of a definite target date.
Nevertheless, it would be advantageous to have the proposal just as soon as possible.
Some overlap between the use of NLS and the use of Word/1 would be necessary.
Custer will see what can be done to obtain a TIP port for CSG.
If necessary, CSG will acquire a terminal specifically for the Survey project. They are also interested in the possibility of off-line input.
CSG doubts the feasibility of assigning Survey personnel to a night shift or to irregular hours. However, they recognize the great advantages of doing so. Savin will determine whether premium pay could be charged to their NSF contract.

Rob--
Upgrading our indexing, production, and project control capabilities.
I have no schedule, so why don't you agree on one to suit your own conveniences? I would appreciate it also if you would arrange for me to meet at least briefly with Bert Raphael to discuss the same topics in more general terms.

Dr. Cima
To give first priority to getting recommendation on interim grant to NJIT to STIA by next Monday.
I relayed Dr. Burchinal's report on the Z.39 Task Force meeting of last Friday. Dr. Cima will call Mr. Brandhorst for more details.
I reported on yesterday's program review.
I also outlined my plans for zero-base budgeting, and referred him to my file <zbb>.

Mrs. Rhodes
To brief me on EPC2 at 9 a.m. on April 4.
The case for EPC3.

Miss Stoltz
My appointments.
Her workload.
Her success in searching <index>.

Mr. Dahlen (NLM)
I agreed to review an EIE-related proposal from Slamecka and to nominate site visitors from the membership of EIES.

Dr. Savin

To handle the commitments to Dahlen.

Site visit

Dr. Savin, Mr. Custer, and I met with Mr. Creager, Mr. Strawhorn, and Mr. Hawkins at the CSG offices in Rockville. We began by setting aside the questions of whether to use NLS for the RANN project and whether SRI's not-for-profit and non-taxpaying status would present an obstacle to conversion of the Innovation Survey project to NLS.

Technical issues:

- Conversion of word/1 files
  - feasibility
  - cost
- NLS capabilities for output processing
  - Underlining--this would be extremely desirable but not absolutely critical at a terminal.
  - Typesetting
    - scientific characters
    - full-page make-up
    - turnaround time
    - magnetic tape for local printer
    - costs
  - Access to local high-speed printer
- CRU requirement for project operations. Hawkins will provide quantitative data on past computer usage in project.

In discussing these issues with Jim Norton my objective will be not only to obtain the answers but to obtain them in the form of a definitive proposal.

The proposed effective date will have to be left blank (it would be later than April and earlier than August in all probability), since CSG's present contract status precludes establishment of a definite target date.

Nevertheless, it would be advantageous to have the proposal just as soon as possible.

Some overlap between the use of NLS and the use of word/1 would be necessary.

Custer will see what can be done to obtain a TIP port for CSG. If necessary, CSG will acquire a terminal specifically for the Survey project. They are also interested in the possibility of off-line input.

CSG doubts the feasibility of assigning Survey personnel to a night shift or to irregular hours. However, they recognize the great advantages of doing so. Savin will determine whether premium pay could be charged to their NSF contract.

Bill, you may wish to give John a printout of this branch.

c77-03-29

Miss Stoltz

Preparing for our program review.

Dr. Burchinal

Wanted our best estimate of when the EPC solicitation would go to ARB. I told him May, considering DGC's workload.

Later I relayed a rumor reported by Mrs. Rhodes: that the Board had voted on whether to hold up the project and (by design) had divided evenly, freeing the Acting Director from any occasion for embarrassment; further, that Atkinson had determined to cool the project for this fiscal year.

Mr. Griffin (DGC)

RADC will not write an interagency agreement beyond September. He will work with Mr. Custer to devise some scheme for transferring as much as possible as soon as possible and--if possible--without going through the ARB again.

Mr. Weinberg (CLB)
When will the EPC decision be made? Still under consideration.

Dr. Burchinal, Dr. Ganz, Dr. Weiss, and Miss Ebenfield
Zero-Base Budgeting: We are to meet from 2 to 5 pm on April 11 with decision packages and decision package rankings.
In the future, DSI staff meetings will be held Thursdays at 8:30.

Dr. Turoff
Grant falls $3,000 short of covering salaries through April. Funds for Telenet will also expire at that time. Lou, I believe you should give a high priority to getting a recommendation to STIA by April 4 for ARB consideration on April 7.
Has rebuilt EIES three times in recent weeks. Hopes to introduce 24-hour, 7-day operation in the near future.

Mrs. Rhodes
Preparing for our program review and for ZBB.

Dr. Weiss
Confused over ZBB

Dr. Burchinal
Dr. Averch wants to be briefed on EPC. I am to take Burchinal's and my calendars to his office tomorrow and arrange an appointment with Audrey.

c77-03-28
Letter to Mr. Baer*
re p00750 <39585,>
Mr. Robert M. Baer
METADATA Corporation
P. O. Box 746
Mill Valley, CA 94941
Dear Mr. Baer:
Thank you for your March 14 letter to Dr. Granger expressing your views on Federal support of scientific and technical publication. I have no doubt that this subject will be taken up in the near fuure by the President's Committee on Science and Technology. Meanwhile, I intend to bring your letter to the attention of the Foundation's Task Force on Science Information Activities at its next meeting, which will take place here on April 25-26.
Sincerely yours,
Harvey Averch
Acting Assistant Director
for Scientific, Technological
and International Affairs

Dr. Burchinal
Asked for publications on Trends in Scholarly Publication. (Provided.)
Reported briefly on Z.39 meeting and asked me to have Lou call Brandhorst for details.

Miss Stoltz
Preparing for our program review.
Dr. Burchinal
wanted our best estimate of when the EPC solicitation would go to ARB. I told him May, considering DGC's workload.
Later I relayed a rumor reported by Mrs. Rhodes: that the Board had voted on whether to hold up the project and (by design) had divided evenly, freeing the Acting Director from any occasion for embarrassment; further, that Atkinson had determined to cool the project for this fiscal year.
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Has rebuilt EIES three times in recent weeks. Hopes to introduce 24-hour, 7-day operation in the near future.
Mrs. Rhodes
Preparing for our program review and for ZBB.
Dr. Weiss
Confused over ZBB
Dr. Burchinal
Dr. Averch wants to be briefed on EPC. I am to take Burchinal's and my calendars to his office tomorrow and arrange an appointment with Audrey.

c77-03-26
ORSA
This is what I mostly spent the day on.

c77-03-24
Letter to Mr. Peters*
re p00752
<39661,>

Division Of Science Information
Mr. Paul E. Peters
Social Sciences Information
Utilization Laboratory
G-7B Mervis Hall
University of Pittsburgh
Pittsburgh, PA 15260
Dear Mr. Peters:
I have now read your progress report on PERIOD/QUOTE, and I want to congratulate you on your successful application of

computer technology to scholarly publishing. As you will recall, one of the objectives of our EPC project is to foster just such applications

Two specific comments come to mind. First, your processing appears to begin with a rekeyboarding of authors' manuscripts. Have you considered the use of author-supplied cassettes or OCR-scannable copy?

Secondly, the "Ethnic Studies Bibliography" does not feature mathematical expressions, tabular material, or any kind of graphics. How do you deal with this kind of thing?

What I found most interesting in your report was that you are are responsible for thirteen periodicals, four annual reference guides, and a series of monographs and textbooks and that over 3,000 pages of copy have been processed through your system. On what terms do you suppos the resulting machine-readable corpus could be released for electronic distribution?

Sincerely yours,
H. E. Bamford, Jr.
Program Director
Access Improvement Program

Comments: insert under March 24
Letter to Loewenberg*
re p00746 <39587,>

Division Of Science Information
Mr. Gerhard Loewenberg
Legislative Studies Quarterly
304 Schaeffer Hall
University of Iowa
Iowa City, Iowa 55242

Dear Mr. Loewenberg:

I want to thank you for your letter of March 9 conveying the report of your first year's experience with LEGISLATIVE STUDIES QUARTERLY. The report has been forwarded to Dr. Harold Bamford, the program director responsible for our work on the Editorial Processing Center concept. He tells me that as a result of recent publicity received by that concept he has received numerous reports of related innovations. I am sure I don't have to tell you how valuable we find such contributions in our planning.

Sincerely yours,
Lee G. Burchinal
Director

Miss Stoltz
Workload.
Access to NLS. In the future she will have top priority for access to TNLS from 9 to 10 and from 2 to 4, or until she relinquishes access.

Dr. Cima and Dr. Savin
The problem of priority access to NLS.
The problem of EIE program evaluation. We recognized the

following options and agreed to think about them for a week:
Encourage Colin Mick to submit some variation on his proposal (p00751) while I am in Palo Alto.
Stimulate comparable proposals by others.
Consult members of the NJIT Advisory Group and of the EIE Evaluation Panel.

Dr. Savin
To finalize the Krall package, to which I may add a memo on its applicability to zero-base budgeting.
I briefed him on the UK involvement of the Innovation Survey.

Dr. Cima
Plans for GPO publication of selected reports.

Mrs. Rhodes
To distribute a draft check list for review of technical reports.
Recent correspondence re the EPC project.
The need for explicit criteria by which to discriminate between proposals contemplating different sources of computer support.
The need for a decision on whether to reprogram the FY 77 funds provisionally allocated to CAS. She will see Wolff regarding the solicitation schedule.

Dr. Savin, Mrs. Rhodes, and Mr. Custer.
Lunch.
Mr. Custer briefed (regaled?) us on his recent experiences as King KWAC.
Topics for me to discuss with Jim Norton and John Strawhorn:
Conversion of Word/1 files to NLS. Norton has sample tapes.)
via Tenex?
Cost?
Output processing of converted files
Underlining
Typesetting options, especially scientific characters, and turnaround time.
Problems of contracting with a not-for-profit who charges a fee. Answer needed from Norton.
CRU requirement for CSG operation
Possibility of off-line input.
Possibility of night shift.
Applicability of NLS to RANN project.

Dr. Burchinal
AIP program review next Tuesday.

Miss Stoltz
Preparing for program review.

c77-03-23
Letter to Mr. Rhoads*
re p00753 <39502,>
Division Of Science Information
Mr. Dana C. Rhoads
American Water Resources Assn.
Mississippi River at Third Avenue, SE
Minneapolis, Minnesota 55414
Dear Mr. Rhoads:
We have no record of having received your letter of December 28, 1976. I have referred your March 18 letter to our EPC project manager, Mrs. Sarah N. Rhodes, who will be in touch

with you within a week or so.
Sincerely,
H. E. Bamford, Jr.
Program Director
Access Improvement Program

Letter to Mr. Peters*
re p00752 <39500,>
Division Of Science Information
Mr. Paul E. Peters
Social Sciences Information
Utilization Laboratory
G-7B Mervis Hall
University of Pittsburgh
Pittsburgh, PA 15260
Dear Mr. Peters:
Thank you for your letter of March 22 with the enclosed report on PERIOD/QUOTE and copy of "Ethnic Studies Bibliography." I'll be in touch with you as soon as I have had a chance to read them.
Sincerely,
H. E. Bamford, Jr.
Program Director
Access Improvement Program

Letter to Gutenberg Panelists*
<39499,>
Division of Science Information
The Society for Technical Communication has kindly offered to publish the proceedings of our AAAS panel "Beyond Gutenberg...." I very much hope that we can take advantage of this opportunity. Please let me know if you are willing to do so and--if you are--when you can let me have the final text of your contribution.
Best regards,
H. E. Bamford
Program Director
Access Improvement Program
identical letter sent to:
Dr. George K. Chacko
6809 Barr Road
Washington, DC 20016
Dr. William Paisley
Applied Communication Research
P. O. Box 5849
399 Sherman, Suite 8
Stanford, CA 94305
Mr. David Staiger
American Institute of Aeronautics & Astronautics
1290 Avenue of the Americas
New York, NY 10019

Dr. Roger K. Summit
Information Systems Prog. Office
Lockheed Palo Alto Research Lab.
3251 Hanover Street
Palo Alto, CA 94304
Dr. Murray Turoff
New Jersey Institute of Technology
323 High Street
Newark, NJ 07101

Concept for Upgraded Indexing System
(DJOURNAL, 39486, 1:w)

Secretary
opens p-file for each significant document received.
indexes each p-file.
routes indexed p-files to identlist in order of seniority.

Staff members
using commands in Base
insert j-numbers where applicable.
insert keys.
replace p-numbers with DSI-numbers where appropriate.
delete own idents and insert new ones as appropriate.
modify i-branches whenever it becomes desirable.
refile documents in DSI-files as appropriate, returning
unused p-folders to secretary.

Functions of computer system:
Once indexing is initiated, interrogates user for following
items only:
date
type
identlist
p-number
institution
author
format?
If response to "format" is "Yes" causes insertion of
formatted branch in appropriate NLS file (e.g., <aip,i75>)
and initiates interrogation for next p-file.
Inserts "keys" statement for each ident inserted.
Sends accession list of p-files by Sendmail to each staff
member whose ident is inserted.
Inserts project name if j-number is inserted.
Inserts link to each statement in an aip,c(hron)-file citing
indexed p-number or DSI-number.
Maintains current lists of
institutions.
authors.
keys assigned by each staff member.

Comments: Comments requested.

Miss Stoltz
Workload.
Indexing system.
Dr. Savin
Interpreting the Announcement.
Dr. Savin and Miss Stoltz
Lunch.
Dr. Burchinal

To be the Foundation's sole representative at the first meeting of the Z.39 Task Force Friday.

Mr. Vitol
Guidance in preparing CSG plan for ARB.

Dr. Savin
Guidance in preparing CSG plan for ARB.

Dr. Cima
Advisory Committee for Inventory project to meet over lunch on March 31.

c77-03-22

Miss Stoltz
Workload.

DSI General Staff Meeting
Dr. Burchinal assigned reading and order of battle for review by the AAD/STIA.

Dr. Cima and Dr.Savin
Strategy for the review.

Dr. Savin and Miss Stoltz
Lunch.

Dr. Mick (ACR)
His proposal for evaluation of EIE. (Cf. p00741) We left it that he would put it on the back burner for awhile.

Dr. Averch et al.
Designated members of the DSI staff made their respective pitches.

c77-03-21

Letter to Miss Norby*
<39462,>
Division Of Science Information
Address:
Dear Miss Norby:
Mr. Staiger spoke from notes, and I am therefore unable to provide a copy of his remarks. However, the Society for Technical Communication has offered to publish the proceedings of our panel, and I hope that he will write something for that purpose.
No, I have not attended the STC chapter meetings here in the District, and it is unlikely that I shall be able to attend the National meeting in Chicago.
The Foundation sponsors innumerable lectures. I suggest you ask our Publications Office to send you the NSF Bulletin, in which many of them are announced. Meanwhile, I enclose an announcement of a seminar in which you may be interested.
I'm afraid that the Air Force's Hal Bamford is unknown to me.
Sorry.
Sincerely yours,
H. E. Bamford, Jr.
Program Director
Access Improvement Program

Enclosure
Letter to Mr. Lannon*
re p00743 <39442,>
Division Of Science Information
Mr. E. R. Lannon

Office of Advanced Systems
Department of Health, Education,
and Welfare
Social Security Administration
Baltimore, MD 21235
Dear Mr. Lannon:
I want to thank you for relaying Mr. Phillips' extensive comments on the EPC and for providing the information as to his eminence in the field of typesetting. I shall reply to his letter as soon as I have the benefit of staff reaction to it.
Sincerely,
H. E. Bamford, Jr.
Program Director
Access Improvement Program

Letter to Mr. Phillips*
re p00743 <39443,>
Division Of Science Information
Mr. Arthur H. Phillips
73 Holland Road
Exmouth, EX8 4BA
Devon, England
Dear Mr. Phillips:
Mr. Lannon has been kind enough to forward your recent letter commenting on the Aspen System Corporation's interim report of its EPC tests. I am very grateful for your thoughtfulness in providing such a valuable commentary, to which I shall respond as soon as I have the benefit of staff reaction.
Sincerely,
H. E. Bamford, Jr.
Program Director
Access Improvement Program

Visit to SRI on April 6?
I plan to be in Palo Alto on April 7 and can arrange for site visits in the area on April 6 if it would be useful. Suggestions are welcome. One topic for discussion with Jim Norton might be the conversion of the Innovation Survey (CSG) to NLS.
Miss Stoltz
Review of workload.
Dr. Burchinal
A letter to answer.
Plan for continuation of Innovation Survey returned for revision.
Mr. Burke (Aspen)
To comment on Arthur Phillips letter re EPC (p00743).
Mr. Honkala (AGI)
I agreed to meet with a group of his society representatives to discuss the EPC on April 18, 1977.
Projectevents
Bill, please bring your branch j080 up to date.

Index
This <aip> file has gotten too long for convenient use and has been replaced by i75 (records dated through CY 1975), i76 (records dated in CY 1976), and i77 (records in and after CY 1977).

DSI Staff Meeting
PDs are to make brief presentations at the April 25-26 Task Force meeting, stating in their own words (Dr. Burchinal will provide guidance) where we have gone in recent years and possible directions for the future.
We must also prepare statistical tables on obligations and proposals in FY 74-76, together with judgments as to what we could have done with additional resources.
Dr. Burchinal will try to get Joe (Wyatt?) to visit with us on April 5 or 11.

EIE
Mike McGill (Syracuse University) hopes to submit proposal by April 1.
Wants to budget for services of a faculty member as an evaluator, consistent with guidance on p. 4 of Announcement under "Assessment." However, notes that on p. 7 under "Budget" it is provided that no funds be requested for professional personnel other than the project director. The faculty member in question is neither project director nor a member of the community. I advised that what we had intended to exclude was funding of activities which would have been carried out in the absence of a trial project. He will therefore request the funds in question, explaining in a footnote that such a request is consistent with the spirit of the Announcement.
He raised a similar question in regard to funds for a graduate assistant to serve as Coordinator in accordance with guidance on p. 3 under "Small Research Communities." The budget model on p. 12 provides no category for such an expense. I suggested that it would be consistent with our intent to introduce a suitable category--e.g., "Graduate Assistant."

c77-03-19
ORSA
Spent the day working on policy implications of networks for editorial processing.

c77-03-17
EPC
Dr. Burchinal, Mrs. Rhodes, and I spent almost the whole day waiting on the NSB Programs Committee and the full NSB, before each of which Dr. Burchinal presented our plan for operational trials. Reaction was mixed.

Dr. Savin
Plans for the EIE evaluation panel.

Dr. Warren Klare
Had left a memorandum (p00744) on "Universities and the E.P.C. concept" and wanted to talk about it. His organization is seriously interested in proposing and may be a serious contender.

c77-03-16
EPC
Mrs. Rhodes and I met with Dr. Burchinal to review plans for his presentation to the NSB Programs Committee. Mrs. Rhodes

then revised the materials she had prepared for him, and in the afternoon we all met with Dr. Granger, Mr. Ubois, and Dr. Ries for a dry run. A few questions were raised for which we plan to have the answers tommorrow.

Dr. Savin
Lunch.

Dr. Cima, Dr. Holt, et al.
A sound film on Holt's research community communication net, "DEAN".

c77-03-15

Dr. Cima
Inputs to Second Quarterly Report to Congress.
Vitol concurs in plan for inter-agency agreement with NCLIS without peer review.
Projectevents.

Dr. Savin and Miss Stoltz
Lunch.

Health Unit
Final phase of medical examination.

Mrs. Rhodes
Material for Dr. Burchinal's remarks to Board.

c77-03-14

Mrs. Rhodes
Use of <index>.

Dr. Burchinal and Mrs. Rhodes
Planning for NSB and Programs Committee presentations on EPC.

Mr. Redecke
Guidance on presentations.

Health Unit
More tests.

DSI Staff
Second Quarterly Report to Congress (covering January, February, and March) inputs due to Dr. Burchinal by noon March 15. (Lou, please?)
Report on actions recycled during March due to Lederman by April 4. Miss Mellette will collect inputs April 1.

Proposal packages reviewed.....
Packages approved without change.....
Packages returned for minor adjustments.....
Packages requiring major adjustments (give reasons for each).....

Granger expected to become Science Counsellor in London in June.

Mrs. Rhodes
Brainstorming Burchinal's remarks to Board.

c77-03-12

Dr. Savin
Plan for refunding CSG.

c77-03-11

Memorandum to Mr. Cutler*
re p00734 <39420,>
Robert Cutler
Program Director, AIP

Second Meeting of Subcommittee on Science and Technology, NSF Task Force on Science Information Activities

Subject meeting was held in the Room 642 immediately following the plenary session of the Task Force on March 6, 1977. The following were in attendance:

Mr. Theodore Moreno
Dr. Howard L. Resnikoff (Chair)
Professor M. Robert Willcott
Professor Martha E. Williams
Dr. Peter A. Alsberg (University of Illinois)
Dr. H. E. Bamford (NSF)

Dr. Alsberg briefed the Subcommittee on the state of communications technology. Among other things, he discussed a variety of network topologies (star, ring, complete interconnected, distributed control) and media (multiple access broadcast, packet radio, fiber optics, buried waveguide).

Dr. Resnikoff focussed on the problem of access. Observing that publishers provide access, not information, he indicated that some of those present at the plenary session appeared not to appreciate the historical juncture at which we find ourselves. Noting the favorable cost trends exhibited by a variety of technologies, and explicitly including the costs of delay and effort in gaining access to STI, he suggested a public bank of S&T literature to which "publishers" could provide access for a fee. Other points which he made were that the Task Force should consider recommending some action with respect to the information activities of Federal agencies and that (contrary to views expressed at the plenary session) technical language really serves a purpose.

Professor Wilcott called for more briefings such as that presented by Dr. Alsberg. He took exception to the undue emphasis which he felt that some members of the Task Force and of the DSI staff placed on the data content of literature, neglecting the importance of the accompanying text. He questioned whether NSF should be concerned with science for scientists or for the public and suggested that one possible role for NSF is that of taste maker.

Professor Williams and Mr. Moreno stressed that the Subcommittee and the Task Force would have to make recommendations on the Foundation's role in relation to S&T communication and on the DSI budget.

All agreed that publishers will have to adapt to the inexorable advance of the technologies applicable to S&T communication.

The Subcommittee briefly considered the shape which the Task Force's final report should take, but concluded that it was premature to take a position on this matter.

The Subcommittee agreed to hear a presentation by Mr. Donald King on the Foundation's Systems Analysis of Scientific and Technical Communication in the United States at its meeting in Washington in April.

The Subcommittee confirmed its plan to meet in Palo Alto on April 7 and to hear presentations on a variety of technologies, including one by Mr. James Norton on augmentation technology. It was agreed to allow each speaker forty-five minutes plus time for questions.

H. E. Bamford

cc: Dr. Resnikoff
Memorandum to Mr. Cutler*
re p00735 <39303,>
Robert Cutler
Program Director, AIP
Announcement for Federal Register
Draft of subject announcement is attached per our conversation of Monday afternoon. Please advise me when it has been approved so that I may proceed with arrangements for the Subcommittee meeting.
H. E. Bamford
Attachment
Federal Register*
<39352,>
National Science Foundation
Science and Technology Committee for the
Science Information Activities Task Force
Open Meeting
In accordance with the Federal Advisory Act, Pub. L. 92-463, the National Science Foundation announces the following meeting:
Name: Science and Technology Committee for the Science Information Activities Task Force.
Date: April 7, 1977.
Time: 9 a.m. to 4 p.m.
Place: Board Room, Varian Associates, 611 Hansen Way, Palo Alto, California 94303.
Contact: Dr. H. E. Bamford, Staff Liaison Officer, Room 1201, National Science Foundation, Washington, D.C. 20550, Telephone: (202) 632-5800. Persons planning to attend should notify Dr. Bamford prior to the meeting.
Summary Minutes: May be obtained from the Committee Management Coordination Staff, Division of Personnel and Management, Room 248, National Science Foundation, Washington, D.C. 20550.
Purpose of the Task Force: To provide advice and recommendations concerning the appropriate roles and responsibilities of the National Science Foundation regarding the communication and use of scientific and technical information. This committee, one of four established by the Task Force, will explore fields of science and technology pertinent to the Task Force's charge.
AGENDA:

9:00 a.m.	Welcome and introductory remarks by Chairman.
9:10 a.m.	Presentations on technologies applicable to scientific and technical communication.
Noon	Recess.
1:00 p.m.	Presentations on technologies applicable to scientific and technical communication.
3:00 p.m.	Open public participation.
4:00 p.m.	Adjourn.

Fred K. Murakami
Committee Management Officer

c77-03-10

Mr. Cutler
Guidance on the Federal Register announcement.

Z.39
Dr. Burchinal, Dr. Cima, and I met with Mr. Trezza and Ruth Tighe to agree on procedures for setting up a task force to consider the institutional and operational future of this ANSI committee.

Electronic Data Banking
Dr. Cima and I met with Mr. Staiger and Mr. Torgelson to discuss plans for a pilot demonstration of this system and for its subsequent expansion to "global" scope.

EPC
Mrs. Rhodes and I met with Mr. Staiger to get the benefit of his thinking on this subject.

c77-03-09

Miss Stoltz
Sick leave.

Dr. Hunt
I briefed him on philosophy, strategy, and structure of program.

Mr. Kuipers
He presented his latest draft of a proposal to implement a system for computer-assisted characterization of documents in terms of the structure of their idea content as perceived by a user. I indicated interest but had to say that we would not underwrite the implementation of such a system merely in order to evaluate it.

Mrs. Rhodes and Mr. Burke
Results of Aspen trials.

Professor Williams
I answered her questions on the structure of the program and slipped in a little philosophy and strategy. She is very interested in inventory.

Dr. Burchinal and Dr. Cima
Planning a nominating caucus for a commission to study the Z39 problem. Dr. Burchinal decided on a telephone conference on March 15 with the heads of ten organizations, to be followed by a meeting here the morning of March 25. We will meet tomorrow morning with Trezza et al.
We advised Dr. Burchinal that the NOAA proposal should be handled by AIP.

Dr. Cima and Dr. Savin
Review of the returns from Roxanne's survey of nonusers. We tentatively decided to retain Group 20 as a communication directory and encourage the formation of subgroups on special interests.

c77-03-08

Dr. Burchinal et al.
Appointments with Professor Hunt and Professor Williams.
A meeting Thursday at 10 a.m. with Trezza et al.

Science Information Activities Task Force
Devoted the day to this function.

Dr. Savin
Lunch.
Possible conflict between his travel plans and the need to complete the Innovation Survey refunding plan.

The problem of non-participation in EIE.
Mr. Osborn
An offer to publish the proceedings of the Gutenberg panel.
Miss Stoltz
Her plans.
Dr. Cima, Mrs. Rhodes, and Miss Stoltz
Preparation of statistics on peer review in CY 1976.
c77-03-07
Mrs. Rhodes
Reviewed a variety of matters.
Lunch.
DSI Task Force
Spent most of the day attending this function.
Technology Subcommittee
See memorandum to Mr. Cutler dated c77-03-09.
Mr. Cutler
Guidance on announcing April 7 meeting.
c77-03-06
Worked today in lieu of Saturday.
Dr. Cima
Asked me to review material he had prepared for Dr. Burchinal on options for the DSI Task Force.
Reported on his interview with Krall and Burgoon.
c77-03-05
Unable to work o/a scheduled power outage.
c77-03-03
Annual leave.
c77-03-02
Annual leave.
c77-03-01
Memorandum to Mr. Murakami*
<39302,>
Fred Murakami, PER
John V. Granger, AAD/STIA
L. G. Burchinal
Director, DSI
Request for Variation in Hours of Work
It is requested that Mrs. Sarah Rhodes, of our Access Improvement Program, be assigned to the "first 40 hours" work schedule, effective at the beginning of the next pay period. Last December she was assigned at my request to a Sunday-through-Thursday schedule. The assignment for which approval is now requested is consistent with the intent of my earlier request--viz., to shift a substantial part of her workload from the regular work week to a period in which demand for the computer resources she uses is slack.
L. G. Burchinal
Memorandum to Dr. Burchinal*
<39190,>
L. G. Burchinal
Program Director, AIP
Options for DSI

5. Access to Text

Access to a useful passage of text normally entails four steps:

* Identifying a potentially useful source, such as a document, whose very existence may be unsuspected.
* Locating the identified source in one's own collection or in that of a colleague, at a convenient point of distribution (e.g., library, vendor), or in a remote repository.
* Gaining access to the source either directly or by interlibrary loan, photocopy, or analog or digital transmission.
* Searching within the source for useful passages.

In each of these steps barriers of time, effort, and cost separate the STI in the passage from useful application. The higher the barriers the lower the probability that the STI will see productive use. The work in which the STI might have been used will in most cases be done anyway, but its output is likely to be inferior in quantity or quality for lack of information input. The ability of scientists and engineers to build on the work of their predecessors is impaired, and research is duplicated unnecessarily through ignorance of what has already been done.

NSF Roles:

MONITOR the communication process, make data on its workings and inadequacies available to the public, and rely on the scientific community to overcame whatever barriers to communication may exist.

* Time Series
* Systems Analysis
* Seminars and Workshops

SUPPORT RESEARCH on ways (such as the Electronic Alternative) of overcoming the barriers, and rely on the private sector to implement the results.

* Searching resources of STI network.
* Management of personal information resources.
* Facsimile and electrodigital presentation.
* Resource sharing.
* Computer-aided scanning.
* Capturing new text in electrodigital form.

SUPPORT DEVELOPMENT of improved systems for providing access to text--e.g., distribution of separates, print-on-demand, and EIE--through proof-of-concept.

* STI Resource Inventory
* STI earth satellite
*Resource Sharing Networks

INVEST in improved operating capability.

* Key Inventories
* Network Interface Structures
* STI Satellite System

SUBSIDIZE the operation of private distribution systems.

* Key Inventories

6. Access to Data

Access to the numerical data accumulated in scientific research entails the same steps as access to text. It is much more difficult, however, for three reasons:

* The staggering quantities of data which are accumulated by automatic sensors and collection systems, and the corresponding necessity to screen, evaluate, and interpret the data accumulated.
* The low level of publication which most of the data receive, amounting in most cases to little more than deposit in a collection accessible to at least some potential users.
* The absence of anything resembling the abstracting and indexing or the reference search services by which potentially useful documents can be identified.

The barriers to the productive use and the consequences of non-use of these data are the same as for text.

NSF Roles:

MONITOR the accumulation and distribution of data, publish assessments of the sitation, and rely on the scientific community to deal with the problem.
* Inventory of Data Banks
* Time Series
* Seminars and Workshops

SUPPORT RESEARCH on methods of recording, organizing, and distributing numerical data, relying on the private sector to implement the results.
* Screening and quality control
* Management of distributed data banks for compatibility and remote access
* Identifying files of applicable data

SUPPORT DEVELOPMENT of improved systems (e.g., a distributed network of data banks) for making data accessible.
* Capture, manipulation, and display of numerical data
* Remote access to data banks
* Associating numerical data with interpretive text
* Data tagging/flagging

INVEST in key elements of such systems.

SUBSIDIZE data accessing services.

7. A&I Services

These services organize the literature as it is published in such a way that potentially useful documents can be identified. Most of the world's S&T literature is covered by at least one of these services, and much of it is covered by several. The services vary, however, in their treatment of the literature they process. Among their points of difference may be mentioned definition of the field covered, bibliographic description, depth of analysis, indexing vocabularies, format, and speed.

One consequence of this lack of coordination is an aggregate cost of processing greater than could be achieved through coordination of their efforts. Far more important is the fact that their products are less useful than they might be. For many users it is necessary to rely on more than one service to search for sources of information on a given topic. This cannot now be done in a single procedure for all services, but must be done in a separately tailored, time-consuming procedure for each, with substantial overlap

of the references cited as a result. By their lack of coordination the a&i services themselves thus raise formidable barriers of time, effort, and cost to the productive use of the information reported in the literature they process.

NSF Roles:

MONITOR the activities of the a&i services, publishing assessments of their performance, and relying on the services themselves to overcome the problems thus identified.

SUPPORT DEVELOPMENT of a network of a&i services, working together to maximize their collective efficiency and the utility of their combined output.

INVEST in network interface structures.

SUBSIDIZE the operation of the services.

X. Current and Informal Communication

(To be drafted)

NSF Roles:

MONITOR

SUPPORT RESEARCH

SUPPORT DEVELOPMENT

INVEST

SUBSIDIZE

H. E. Bamford

Dr. Burchinal

I expressed my disappointment that I had not been given the responsibility for preparing material on augmentation for the Task Force. He assured me that we would be able to input to Joel's presentation. He also agreed to the addition of a problem area on current and informal communication.

Dr. Cima and Mrs. Rhodes

I reported on yesterday's meeting with Dr. Atkinson.

Dr. Savin

To press strongly for proposals by March 31.

Rose Lavendar, Bessie White

Guidance on getting Mrs. Rhodes assigned to a "first forty hours" duty schedule.

Mr. Vitol

Returned the RADC recommendation for repackaging.

Mrs. Rhodes and Dr. Savin

Lunch.

Mr. Custer

To repackage the RADC recommendation.

Dr. Cima

Preparation for meetings with Dr. Burchinal et al. on options for the Task Force.

Dr. Burchinal and Dr. Cima

Dr. Burchinal wants us to make a grant to ASIDIC for participation in an international meeting anyway we can do it.

Mr. Vitol

Ruled out the possibility of a purchase request.

Dr. Cima

To procure a proposal from Martha Williams by EIE and get it reviewed the same way.

LC:

c77-03-30
Letter to Texas Instruments* (DJOURNAL,39601,1:w)
Division Of Science Information
Texas Instruments, Inc.
12203 Southwest Freeway
Stafford, Texas
Dear Sirs:
Following instructions from Mr. John Veyette of Engineering Index, New York, I am returning your shipment of a replacement keyboard for a TI (#0860, TI# 13051529). As you know, we need a new keyboard with upper and lower case keys.
Sincerely yours,
Louis Cima
Associate Program Director
Access Improvement Program
Letter to Veyette* (DJOURNAL, 39590,1:w)
Division Of Science Information
Mr. John H. Veyette, Manager
Marketing Division
Engineering Index, Inc.
345 East 47th Street
New York, NY 10017
Dear John:
Thank you for submitting 2 copies of the Benson & Benson report "Study of Nationwide On-Line Access to Evaluated Engineering Design Data ...", prepared under NSF Grant DSI-76-16654. I am depositing a copy of it in the NTIS for dissemination. I am afraid that I would probably miss the NTIS announcement on it, but I'll send you its PB number and price as soon as NTIS announces them.
Sincerely yours,
Louis Cima
Associate Program Director
Access Improvement Program
Letter to Westrum* (DJOURNAL, 39589, 1:w)
Division Of Science Information
Dr. Edgar F. Westrum
Department of Chemistry
University of Michigan
Ann Arbor, MI 48109
Dear Ed:
I have forwarded your request for information on data flagging/tagging to John Murdock. He has just completed his study on data indexing activities. I am quite sure that he would allow you a prepublication look at his work. So please contact him directly. Our only requirement is that when and if you use John's study, you give due credit to NSF and to Informatics.
Sincerely yours,
Louis Cima
Associate Program Director
Access Improvement Program
cc: John Murdock
c77-03-24
Memo to Kenefick re Gellman* (DJOURNAL, 39554, 1:w)
Michael Kenefick, DGC

Associate Program Director
Access Improvement Program
NSF Contract C-76-05499, Gellman
I recommend that the Gellman Contract "Scientific and Technical Information for Critical Period Management" be extended to April 15, 1977, without additional costs. This additional time is needed to review the preliminary final report and to prepare the final version of the report.
Louis Cima

Memo to Kenefick re Gellman* <DJOURNAL, 39504, 1:w>
Michael Kenefick, DGC
Associate Program Director
Access Improvement Program
NSF Contract C-76-05499, Gellman
I recommend that the Gellman Contract "Scientific and Technical Information for Critical Period Management" be extended to April 15, 1977, without additional costs. This additional time is needed to review the preliminary final report and to prepare the final version of the report.
Louis Cima

Letter to Feinman* re BBC <DJOURNAL, 39503, 1:w>
Division Of Science Information
Mr. Stephen Feinman
Gellman Research Associates, Inc.
100 West Avenue
Jenkintown, PA 19046
Dear Steve:
We are pleased to hear that the British Broadcasting Corporation would like to use the Apollo 13 Case Study from the "Crisis Management" report being produced under NSF Contract C-76-05499. This case study would be used as source material for a BBC dramatic documentary on the Apollo 13 incident. You are authorized to release the Apollo 13 Case Study to BBC with the explicit understanding that NSF will receive due credit, and that no parts of the study would be copyrighted by any party. The Foundation retains full ownership rights to the Case Study.
Let me know if we can be of further assistance.
Sincerely yours,
Louis Cima
Associate Program Director
Access Improvement Program

Letter to Tomlinson* (DJOURNAL, 39553, 1:w)
Division Of Science Information
Dr. R. F. Tomlinson, Chairman
CODATA Task Group on Space
and Time Dependent Data
17 Kippewa Drive
Ottawa, Ontario K1S 3G3, Canada
Dear Roger:
Thank you so much for sending me a copy of your short report on the Task Group on Space and Time Dependent Data planning meeting. From the report, I can tell that the meeting must have been very interesting and successful.
I regret that due to unforseen reasons I could not attend. I would, however, appreciate it if you would continue to keep me

advised on the development of your timely project.
Sincerely yours,
Louis Cima
Associate Program Director
Access Improvement Program
Enclosure

NCLIS/Z39
Price of NCLIS read me on the phone his proposal for an interagency agreement re Z39...I suggested some modifications to his budget format...final copy ready to-morrwow.

GSA/GIS Annual Meeting
Call for papers from R. Walker (Program Chairman) for the annual meeting of the Geol. Soc. of Am./Geos.Info. SoC. next November in Seattle...he will sent me me proposed agenda and theme of meeting and then I'll see.

Anita
Asked Anita to place an order for paper for our portable TI's, also asked her to had addressees to 2 of my letters she sent me by journal mail yesterday.

Andy Aines
Since he is a member of an ad hoc task force to recomend on ERDA's information programs, I gave him a copy of QEI's study on renewable energy info/data systems especially tailored to ERDA's needs.

NFAIS
At 1545 hours, I phoned NFAIS...no answer...it seems that they have short working days overthere!

c77-03-23

NSF Distribution of Important DSI Reports
Several days ago, following my suggestion, Dr. Burchinal asked me to look into ghe possibility of arranging with Swingle the issuance of our best reports...I have contacted him and he will give me some costs estimates...main thing, he says is to avoid issuing a publication which would look like a serial...this would require GPO (or is it OMB?) approval. It can be titled something like"DSI Information Reports No...." we will further discuss this matter... TIP is going down now...

Foreign Directory of Energy Info. Sources
Contacted Bob Kohn...he was supposed to deliver to me the tape, and I was to pass it on the Swingle (NSF Printing Off), who would arrange to get estimate for camera ready caopy and printing of the work... tape will be aout 2 weeks late because of errors.

Gellman's study on Crisis Management
BBC would like to use Gellman's Apollo 13 Case Study as source material for its dramatic presentation of the Apollo 13 incident. I phoned Steve Feinman telling him that our authorizing letter would reach him soon.

Steering Group for Z39
Finally able to get in touch with NCLIS (They go to more meetings than we do). Gave Ruth Tighe guidance for preparing their request for co-sharing the costs for the Group. She wanted me to write the letter, but I have convinced her (I think) that the letter should be a simple short one and that I would be glad to react to it by phone if she wishes to read it to me. Deadline is as soon as possible.

Dr. Burchinal
Needed copies of materials on Z39 for his meeting March 25.
Krall's Inventory
After making some changes in the Advisory Panel membership, the meeting was reconfirmed for the 31 (Rm 1114, at 11:30)
CCNBC Meetings
Have received agenda of the April 7 & 8 CCNBC meetigng...checked with Naugthen about the "closed" aspect of meetings...he could not decide and suggested that I contact the Legal Counsel person in charge of the "Sunshine" matter for an opinion on its legality and openess (he's not in today, will check later).

c77-03-22
Letter to Spindel, NAS* <DJOURNAL, 39482, 1:w>
Division Of Science Information
Dr. William Spindel
National Academy of Science
National Research Council
Office of Chemistry & Chemical Technology
2100 Constitution Avenue
Washington, DC 20418
Dear Dr. Spindel:
This refers to my letter of February 9, 1977, providing guidance on NSF requirements for the submission of final technical reports and enclosing additional copies of NSF Important Notices on this matter, which had been previously mailed to all institutions holding NSF awards. Similar letters went out to all of our Principal Investigators whether grantees or contractors. In as much as the letter contains the provision that "contractors should comply with the requirements on final technical reports stated in the contract", I feel that it does not impose on you any additional requirements with regard to the Academy study on critical data compilation and evaluation activities. I would like, however, to know what plans you have for disseminating the final report on this study. It is not too clear from the original proposal what your plans are regarding the publication of the report.
Sincerely yours,
Louis Cima
Associate Program Director
Access Improvement Program
Enclosures

c77-03-18
Letter to Reviewers of QEI, Informatics, & Battelle* <DJOURNAL, 39483, 1:w>
In January 1975, you as a member of our Technical Review Panel evaluated proposals for improving the dissemination of energy R&D information. You may recall that as a result of your recommendations, the Foundation funded the Informatics, QEI, and the Battelle projects.
Informatics and QEI have completed their work and have submitted copies of their final technical reports. The reports have been deposited in NTIS. A copy of each report is enclosed for your retention. Battelle has also completed the work, but so far, except for the enclosed reprint, we have not yet received their final technical report. I will send you a copy

of it as soon as they submit it to NSF.
Thank you again for assisting us in reviewing and evaluating these proposals.
Sincerely yours,
Louis Cima
Associate Program Director
Access Improvement Program
Enclosures
Addresses for QEI, Battelle, and Informatics
Dr. Ted Albert
Office of System Administration
for Environmental & Safety
E-201
ERDA
Washington, DC 20545
Mr. Charles Gottschalk
Systems Development Office of Technical Information
ERDA
Washington, DC 20545
Mr. Charles Hargrave
Scientific and Technical Information Office
National Aeronautic and Space Admin.
Washington, DC 20546
Mr. Joseph F. Coyne
National Technical Information Service
5285 Port Royal Road
Springfield, VA 22164
Dr. Joe F. Caponio
Environmental Science Information Center
D-8
3300 White Haven Street, NW
NOAA
Washington, DC 20235

c77-03-16
Letter to reviewers of Gellman's proposal* <DJOURNAL, 39376, 1:w>
You may recall that in November 1975 you, as a member of our Technical Review Panel, evaluated proposals for studying how existing information resources may be marshalled to meet emergent information needs. As a result of your recommendations, the Foundation funded the Gellman project. Steve Feinman, the project's principal investigator, has just completed the work and has delivered copies of the preliminary version of his study. I would greatly appreciate it if you would review the enclosed material and provide me with quick reactions to it. I must pass our comments on to the contractor within two weeks. You may keep the preliminary version, but please do not use any part of its contents. Later I will be glad to send you a copy of the final version for you to use as you wish.
Thank you again for assisting us in reviewing and evaluating this study.
Sincerely yours,
Louis Cima
Associate Program Director
Access Improvement Program
Enclosure

Addresses for Gellman project
Dr. Ted Albert
Office of System Administration
for Environmental & Safety
E-201
ERDA
Washington, DC 20545
Mr. Steven C. Goldman
U.S. Arms Control & Disarmment Agency
Washington, DC 20451
Dr. Douglas Berninger
Technical Information Utilization
Herner and Company
2100 M Street, NW
Washintgon, DC 20036
Mr. Avery E. Kolb, Chief
Crisis Management Division
U.S. General Services Administration
Washington, DC 20405
Dr. Thomas F. Bates
Penn State University
212 Deike Building
University Park, PA 16801

EIE
Murray explianed why EIE is down: maintenence people damaged the memory disk...it should be fixed to-morrow...we discussed need for procedures for using EIE...he will draft ideas and send them over (apparently, he had forgotten that we had requested this sometime ago)...also need to start pruning list of users...and need to avoid fun computer conferences such as "Graffiti".

CODATA Dues
As requested by Dr. Burchinal, I briefed Bill Stewart (SRS) about CODATA activities. He has been asked by Dr. Creutz to consider supporting CODATA. I'll loan him CODATA materials.

"DEAN" System
Hal and I were invited to see a film on a computerized message switching system funded by Deane Holt (IDOE)...a very well done film glorifying a rather simple communication system. He is interested in our EIE program.

Inventory Project
George Krall confirmed (via telephone, because he could not get on EIE, he said apologetically) date for 1st meeting of the advisory panel (March 31, here, Rm . 1114).

NFAIS A&I Directory
John Creps will be here March 25 with draft agreement between NFAIS and NTIS re dissemination of the inventory. I asked him to bring also the tapes. NFAIS should keep a copy of them in safe place.

c77-03-07
Options for DSI* <DJOURNAL, 39364, 1:w>
5. LACK OF INTEGRATION AMONG ACCESSING SERVICES
PROBLEM
Accessing services, including the abstracting and indexing services and other bibliographical control systems, have evolved independently. To-day, there is

little effective integration among these services. Services differ in scope, procedures followed for describing their contents, depth of analyses, indexing vocabularies, protocols used, and file format for displaying information.

One consequence of this lack of integration is an aggregate cost of processing greater than could be achieved through systematic integration of their efforts. Far more important is the fact that their products are less useful than they might be. For many users it is necessary to rely on more than one service to search for identifying documents and data on a given topic. This cannot be done in a single procedure for all services, but must be done in a separately tailored, time-consuming procedure for each, often resulting in substantial duplication of information identified.

This lack of integration among accessing services increases the formidable barriers of time, effort, and cost to the productive use of the information they are supposed to help locate.

STRATEGY

I. Research

1- Collect, assess, analyze, and disseminate information and data on the performance of the abstracting and indexing services and of other bibliographical control systems.

2- Study the indexing techniques used by the services, identify and analyze their points of similarity or conflict.

3- Investigate the advantages and problems related to the development and use of a common vocabulary by the services versus use of automated techniques of converting and subject switching; analyze producers' as well as users' viewpoints.

4- Study problems and their alternative solutions regarding the integration of common functions of the services.

5- Investigate the feasibility of designing, developing, and operating automated means for linking and accessing STI inventories, directories, and other accessing services.

II. Development

1- Support development of a network of abstracting and indexing services for maximizing their collective efficiency and the utility of their combined output.

2- Support development of a mechanism for coordinating the accessing activities of the abstracting and indexing services with those of the other bibliographical control systems and quantitative data services.

3- Support developemnt of procedures and techniques for identifying, tagging, or flagging quantitative data imbedded in documents, for use by the accessing services.

III. Proof of Concept

1- Test use of new indexing procedures, software and other means to exploit the resources of accessing services by multidisciplinary and problem oriented

systems.
2- Introduce newly developed quantitative data tagging/flagging procedures in the abstracting and indexing services.

IV. Sustain Operations
1- Fund ongoing operations for:
*Developing standards and stimulating adoption of common procedures regarding information services, libraries, publishers, and networks;
*Achieving coordination between standard setting programs of the bibliographical services and the quatitative data services;
*Stimulating coordination among institutions and services concerned with the bibliographical control of documents and data.
2- Assist in the production and dissemination of inventories and directories on accessing services, computerized data banks, quantitative data centers, and the like.
3- Fund operations of key, comprehensive, transdisciplinary quantitative data accessing services.
4- Fund operations of modular components and links of network for accessing services.

6. POOR DOCUMENT DELIVERY MECHANISM

PROBLEM

Increased use of on-line searching of the major accessing systems is producing an equivalent increase of demand for obtaining potentially useful documents identified by these services. Libraries, the main source of the desired documents, are becoming less able to provide the needed documents in a timely fashion. With level or decreasing budgets against large increases for subscriptions and personnel costs, libraries are unable to maintain subscriptions to journals and book purchases at the levels required by users' demand. One result is increased use of interlibrary loan, which only adds to time delays in access to desired information.

These barriers of time, effort, size, and cost which constrain to-day's document delivery mechanisms, are lowering the probability that the STI will see productive use. The work in which the STI might have been used will in most cases be done anyway. But its output is likely to be inferior in quantity or quality for lack of already existing knowledge. The ability of scientists and engineers to buid on the work of their predecessors is impaired and research is duplicated unnecessarily through ignorance of what had already been done.

STRATEGY

1. Research
1- Maintain comprehensive, systematic analyses of the effectiveness of national document delivery.
2- Test the effectiveness of synoptic journals as substitutes for full text publishing, with full documents available on demand.
3- Test the cost/efectiveness of documents delivery vice

separates, facsimile, microform or electronic means.

II. Development

Nothing

III. Proof of Concept

1- Test alternatives to printed document delivery systems, such as on-demand publishing techniques from printed or microform files.

2- Develop electronic literature and data files through operation of Editorial Processing Centers, and test electronic full text searching and use by means of natural networks.

3- Test the cost/effectiveness of combinations of media (print, microform, electronic, including digital, video images, holographic images) with various transmission means (such as land lines, CATV, slow-scan TV, satellite communication) for accessing and obtaining information.

7. POOR QUANTITATIVE DATA MANAGEMENT

PROBLEM

Quantitative data on space and environment are continuously and regularly accumulated by automated sensors and collection systems. Other systems collect and store data on economic, social, and life quality matters. These data are stored, with little manipulation, on magnetic tapes in many data centers. Data are also accumulated by scientists and engineers in carrying out their research activities. Their data are either imbedded in documents resulting from their research efforts, or stored in repository centers. In addition, physical, chemical, and engineering data published in documents are critically evaluated, stored, and disseminated by information analysis centers.

Altogether, these sources of quantitative data represent a rich and valuable national resource. However, due to the lack of common data management procedures for collecting, manipulating, transforming, storing, and disseminating quantitative data, it is very difficult to identify, search, and obtain potentially useful data. The problem is compounded by the fact that there is nothing resembling the reference search systems that have been developed for document identification.

In many cases, the consequence is that either the researcher duplicates unnecessarily the aggregation of data, or spends a large amount of effort for identifying and retrieving the needed data.

STRATEGY

I. Research

1- Maintain comprehensive, systematic analyses of effectiveness of quantitative data collecting and disseminating programs.

2- Study the degree of uniformity or non-uniformity displayed by data centers in managing their data files, and investigate problems and means for introducing common management practices.

3- Test techniques, already developed for automated bibliographical files, for linking and cross file

searching of quantitative data files.
4- Test alternative ways, including satellite, for on-line remote access to data banks.
5- Study methodologies for locating, evaluating, storing, and disseminating critically evaluated data.
6- Study means and approaches for marketing subsets and products derived from data files, test and evaluate users' acceptance of such products.
7- Test interlinking and networking of critically evaluated data files.

II. Development
1- Develop procedures and software for capturing, manipulating, and displaying electronically quantitative data for document publication, special services, and accessing systems.
2- Develop procedures for establishing a mechanism for collecting, testing, verifying, and making available existing software and documentation packages for searching and exploiting quantitative data files.
3- Develop capability for associating quantitative data with interpretive text.
4- Develop protocols and software for interfacing quantitative data with contents of the Editorial Processing Centers.

c77-03-11
Letter to Turoff* <CJOURNAL, 39296, 1:w>
Division Of Science Information
Dr. Murray Turoff
New Jersey Institute of Technology
323 High Street
Newark, NJ 07102
Dear Murray:
Enclosed is the information Paul Custer thinks will introduce your group to Office 1. If you can get messages to and from Office 1 using TENEX I think it will make things easy all the way around. Paul Custer will help with any problems and if more information is needed he can get it. Bill Savin may be able to do some simple programing in Office 1 system if you need it.
TIP numbers are (201) 932-2750 and (201) 821-8085.
Sincerely yours,
Louis Cima
Associate Program Director
Access Improvement Program
Enclosure

Letter to Colombo* <CJOURNAL,39295, 1:w>
Division Of Science Information
Mr. David S. Colombo
Columbus Laboratories
Battelle Memorial Institute
505 King Avenue
Columbus, OH 43201
Dear Dave:
Here are copies of verbatim comments from reviewers of your proposal. I would suggest that you start pulling these comments together and address their concerns. There are a few

more responses which have not yet been received. When they come in I'll forward them to you. Meanwhile, hold on sending me your response to these comments
Sincerely yours,
Louis Cima
Associate Program Director
Access Improvement Program
Enclosure

c77-03-01
Memo to Kenekick re IA-CA-133 NTIS#
<CJOURNAL,39144,1:w>
Michael Kenefick, DGC
Associate Program Director
Access Improvement/DSI
iA-CA-133, NTIS
We have received 3 copies of the final technical report for its NSF CA-133 project.
These reports are found to be acceptable and is our judgement that NTIS has performed satisfactorily.
A copy of NTIS final fiscal report is attached.
Louis Cima

Letter to Bearman NFAIS#
<CJOURNAL,39143, 1:w>
Division Of Science Information
Ms. Toni Bearman, Executive Director
National Federation of Abstracting &
Indexing Services
3401 Market Street
Philadelphia, PA 19104
Dear Toni:
This refers to your letter dated February 9, 1977, to John Grzechowiak of NSF's Division of Grants and Contracts
The Foundation does require the submission of NSF Summary of Completed Project (NSF Form 98A). This is in addition to the other NTIS forms. You may recall that this requirement was stated in my February 9 letter to you (see enclosed copy).
Sincerely yours,
Louis Cima
Associate Program Director
Access Improvement Program
c/c to Grzechowiak DGC
Enclosure

Letter to Mulvihill AGI#
<CJOURNAL,39142, 1:w>
Division Of Science Information
Mr. John Mulvihill
GEO-REF Bibliography Project
American Geological Institute
5205 Leesburg Pike
Falls Church, VA 22041
Dear John:
I am enclosing verbatim copies of comments from 4 reviewers of your proposal DSI-77-07829, for your consideration. I suggest that you start grouping together common concerns expressed by the reviewers and prepare responses to these concerns. Your response should be in form of a letter which would somehow

modify or revise the basic proposal. Since not all reviewers have sent me their comments, I would suggest that you wait forwarding your response. I will send you the other comments as they come in.
Sincerely yours,
Louis Cima
Associate Program Director
Access Improvement Program
Enclosures

Memo to Kenefick re DSI-76-05499, Gellman*
<CJOURNAL, 39141, 1:w>
Michael Kenefick,DGC
Associate Program Director
Access Improvement Program/DSI
NSF Contract DSI-76-05499, Gellman
I recommend that NSF Contract DSI-76-05499, Gellman, be extended to March 31, 1977.
When Steve Feinman (P.I.) visited the Program Feb. 23, 1977, he told me that the work was completed and the draft of his study report would be forwarded to me within a week or two. The no-cost time extension is simply to allow the contractor sufficient time to convert their draft into camera ready copy form for NSF's printing office.
Louis Cima

PAUL:
c77-03-31
c77-03-30
c77-03-29
c77-03-28
Mr. Griffin (DGC)
I worked with Mr. Tom Griffin to arrive at parameters for our IAG to RADC.
He is attempting to transfer the total $75,000 the details are not yet firm but should be something like this:

Month Date	Basic Subs'	Add'l CRU	
Feb	3	0	
Mar	3	0	
Apr	3	0	
May	3	0	
Jun	3	0	
Jul	3	7	
Aug	3	7	
Sep	3	7	
1/2 Sep	3	8	This is to Sept 30

This should leave about 11,000 in the programming account.
Dr. Bamford
We should discuss 1) Next Years Budget for this account, 2) How we want the CRUs distributed by SRI.
I like the idea of the additional CRUs during the critical period of going to new hardware and to a new version of the software.
New Keyboard
Recieved a replacement keyboard from SRI and shipped the old one back to them.
Bertram Raphael, James C. Norton, Dan C. Lynch

ARC Position Paper (DJOURNAL, 39535, 1:w)
c77-03-25
c77-03-24
c77-03-23
Trip Report
<DJOURNAL, 39485, 1:w>
c77-03-22
James Bair, SRI
<CJOURNAL,38943,1:w> HUMAN-COMPUTER INTERFACE
c77-03-21
c77-03-18
c77-03-17
Architects' meeting at SRI
c77-03-16
Architects' meeting at SRI
c77-03-15
Architects' meeting at SRI
c77-03-14
Architects' meeting at SRI <.d:g>
Opening remarks for Monday at SRI
Location: (CJOURNAL, 39294, 1:w)
c77-03-11
Colonel Misencik <.d:g>
Letter to Colonel Misencik
Location: (DJOURNAL, 39307, 1:w)
c77-03-10
Dr. Bamford <.d:g>
Agenda for Workshop Utility Service Management Meeting at SRI.
<CJOURNAL, 39253, 1:w>.
Dr. Bamford <.d:g>
Agenda for Knowledge Workshop Architect Meeting. <CJOURNAL,
38998, 1:w>.
c77-03-09
Letter <.d:g> # [0367]
To: Colonel Misencik
Defense Communications Agency,
Chief, Record Network,
Management Division, Code 535,
Washington, D.C. 20305
Salutation: Dear Colonel Misencik:
Body:
The National Science Foundation, Division of Information
Systems, is being rearranged. One 2400 baud conditioned
line to the DCCD TIP at Reston will need to be relocated as
a result of this rearrangement.
Your assistance in this matter will be appreciated.
Please disconnect the service at Room 403, 1800 G NW,
Washington, D.C. 20550.
The line number involved is GD09917.
The service should be continued in the same room. This
change is a move of about sixty feet.
The move date will be on or near April 15, 1977, and the
contacts will remain the same. Mr. Custer, Room 403, 1800 G
NW, Telephone number 254-3082, will be available to assist
in locating the new line.
Sincerely yours,

Signature: HEB2
c77-03-08
Dr. Savins' Terminal converted to U/L Case.
SRI (RADC) Recommendation <.d:g>
Memorandum [0144]
TO: Division of Grants and Contracts
FROM: Program Director
Access Improvement Program/DSI
Subject: Recommendation for Interagency Agreement DSI 77-06045
Body
The Access Improvement Program recommends that an interagency Agreement be initiated with Rome Air Development Center (RADC) and that $75,000 be transferred to support Foundation participation in the Stanford Research Institute's Workshop Utility Service IV for a twelve month period.
In line with the instructions in NSF Circular No. 89 the following documents are attached:
1. A summary of the project.
2. A budget.
3. Copies of the proposal and correspondence which initiated the project.
4. A justification for the transaction.
5. A record of discussions.
The program has given up the use of paper in a major part of its activities, substituting an electronic medium. The Workshop Utility Service is being used for the preparation of documents, for management of program files and for transmission of program output.
The proposed agreement with RADC includes funding for a basic subscription, one additinal computer resource unit, and eleven weeks of programming and instruction for the AIP staff. This interagency agreement is to be completely supported by AIP funds.
Signature: HEB2
Summary [0154]
SUMMARY OF THE PROJECT

For the past fourteen years the Augmentation Research Center (ARC) of Stanford Research Institute has conducted R&D to explore the ways in which computers can be used to augment individuals and groups in their performance of knowledge work. The Center introduced its Workshop Utility Service in January 1974 to transfer the results of such R&D to groups wishing to participate in its program. Late last year the Foundation's Access Improvement Program joined the participating community, using the Workshop Utility Service in a variety of staff activities. Its primary purpose has been to assure the familiarity of program staff with one of the technologies upon which the program is based. By testing the feasibility and utility of intensive computer support for the professional staff of a directed research program, this project also serves to blaze a trail for widespread

application of such techniques in the Foundation and elsewhere in the Government. The project is supported through an interagency agreement with Rome Air Development Center, a major participant in the ARC program.

Budget [0339]

TWELVE MONTH BUDGET

Organization:	Department of Air Force Rome Air Development Center Griffiss Air Force Base
Title:	Workshop Utility Service IV
Principal Investigator:	Duane L. Stone
Proposal:	[DSI-7706045]
Amount:	$75,000
Duration:	12 months

A. Basic Subscription Workshop Utility Service IV	$49,052
B. One additional Computer Resources Unit	14,016
C. Programming (appr 240 hrs) and training (appr 225 hrs) *	11,932
D. Total Costs	** 75,000

* The basic subscription provides two weeks of initial training for participants. AIP now has one additional employee. The use of the system is much more complex than that of other user groups. For these reasons an additional eleven weeks of programming and specialized training is being provided.

** Budget items include 30% Burden and 110% overhead and fee.

Justification [0171]

JUSTIFICATION FOR THE TRANSACTION

The Access Improvement Program is a highly integrated program of research applied to improving the accessibility and usefulness of scientific and technical information. Among its published goals (NSF 75-26) are the following:

to share computer-sensible information through a computer communication network.
to provide information-searching capability through remote terminals which individuals can use at their places of work.
to provide computer assistance in the use of

information through the same terminals as are employed to acquire information.

In pursuit of these goals, the program is experimenting with computer augmentation of its staff. The objectives are (1) to gain first hand experience of the technologies upon which the program is based and (2) to assess the feasibility and utility of intensive computer support for the professional staff of a directed research program. The Division of Information Systems is giving technical support to the program in this effort.

The program has given up the use of paper in a major part of its activities, substituting an electronic medium. The system is being used for the preparation of documents, for management of program files and for transmission of program output. Both internal and external communication is being facilitated and the records of such interchanges are being substantially enhanced. Continued favorable experience with this experiment could lead to the widespread application of its techniques in the Foundation and elsewhere.

Record of discussions [0205]

MEMORANDUM TO FILE

FROM: Program Officer, AIP/DSI

SUBJECT: Record of Significant Discussions

A complete record of discussion with NLS users would be so large that it would serve no meaningful purpose. Since the program office participates in the day to day use of the data net there are daily contacts with other users via links, messages, sendmail, etc. For example the undersigned is the Architect for NSF, and in addition to personal contacts at meetings, I have responded to more than 100 correspondences of various nature in the last three months. However, the results of one contact seems to be germane. Mr. Stone, the PI, confirms the continued activity of RADC and their interest in acting as procurment agent for NSF. This message is attached.

Paul E. Custer

Attachment

Memorandum [0291]

To: File

From: Program Officer

Subject: Interim Evaluations of Workshop Utility Service

Body:

The following evaluations were made and are included for information.

Ronald P. Uhlig, Ph.D., Chief Materiel Acquisition Systems Division, U. S. Army Materiel Development and Readiness Command sent: 18 Nov 76 Rec'd 26 Nov 76 Rating Favorable

Harold E. Bamford, Jr., Program Director, Access

Improvement Program sent 19 Jan 77 Rec'd 22 Jan 77
Rating Favorable
Paul E. Custer, Division of Information Systems, MIS Utilization Section Sent 31 Dec 76 Rec'd 13 Jan 77
Rating Favorable

All evaluations are favorable and it is reccomended that a favorable evaluation be placed on this project.

Incl. Dr. Uhligs' Evaluation
Dr. Bamfords' Evaluation
Mr. Custers' Evaluation

Evaluation
< AJOURNAL, 37860.NLS;1, >, 26-NOV-76 09:33 XXX ;;;;
.HJOURNAL="RPU 26-NOV-76 09:12 37860"; Title: .HI="Draft Evaluation of ARC Proposal for NSF"; Author(s): Ronald P. Uhlig/RPU; Distribution: /PAUL([ACTION]) ESV([INFO-ONLY]) ; Sub-Collections: NIC; Clerk: RPU; .IGD=0; .SNF=HJRM; .RM=HJRM-7; .PN=-1; .YBS=1; .PES; Origin: < UHLIG, NSF-EVAL.NLS;1, >, 26-NOV-76 09:06 RPU ;;;;####;

The impact of automatic data processing on society, both in the United States, and in the world has been profound. Projections already show that this will be the major component in the US Gross National Product within a few years. Service to the public would be impossible today without automatic data processing support. Despite frustrations with improperly designed and inflexible software, no one can seriously propose trying to do business today without such automated support.
However, one segment of business has remained largely untouched by the computer. This is the business office itself. Managers, secretaries, and workers in the average business office of today are doing business in much the same way that it has been done for the last century. Material is prepared by hand or by dictation, typed by secretaries, reviewed and retyped, through time-consuming manual processes, and eventually hand mailed or carried to other individuals who must see the products of the office. If a document must be prepared and coordinated with one or more offices the process becomes even more time-consuming.
The proposal by Stanford Research Institute Augmentation Research Center would bring the power of the computer to play in the picture described above. Many of the normal business practices have not been susceptible to automation in the past, for a variety of reasons. Some of these reasons include: cost of computer hardware and software, difficulty of getting at the computer for support, and inflexibility of automated support.
Advancements in electronics technology are solving the problem of the high cost of computer hardware. In fact, that cost has been dropping by a factor of 100 every ten years, for the past twenty years, and there is every indication that this trend will continue for the next decade. As the cost of hardware decreases, the software can become more powerful, and the proposed research by

SRI will capitalize on this fact. The result of the research proposed by SRI will be to create the kind of flexibility in software that is sorely needed in the business offices of the USA.

The SRI work combines the power of communication systems, "word-processing" systems, and general purpose computers into a single integrated system. The manager, secretary or worker can interact directly with the computer, via a terminal, from that individual's own desk, to draft memoranda, documents, letters, and all the normal kinds of paper produced in an office. If the individual is traveling this can be done from another office, or from a motel room. It can also be done from home. If it is desirable, two or more individuals, at widely varying locations, can work together, via a computer "link" in drafting a document. This can reduce the need for costly travel, and greatly enhance travel to meetings when it is required. Thus, this research could be an important factor in reducing energy consumed by business travel in the United States. This can also help overcome "time-zone" problems. For businesses with major offices on both the East Coast and West Coast of the USA this can be a major advantage. If the business also has branch offices in the State of Hawaii or Europe, the impact can be even more dramatic.

The SRI system places draft copies of documents in a central "journal" where it can be viewed by many different individuals who have an interest in it. The potential of this for speeding coordination on complex actions is enormous, whether the people involved are in the same building or in many buildings. This same system can be used to coordinate schedules of busy executives. By placing a copy of their schedule in thie central file, the time-consuming process of making arrangements for a busy group of exectuives to meet can be vastly improved.

The evaluation above is not intended to be an exhaustive discussion of all the implications of the SRI research, but only indicative of the high potential of this work. It is extremely important that continued research be carried out in concert with real offices who are using the "research version" of the system, as it continues to evolve. For this reason, it is important that the National Science Foundation actually use this system in their normal conduct of business. Interaction between users of the system and the researchers will be a major factor in channeling this research along paths most beneficial to the United States.

The research is under the leadership of Dr. Douglas C. Engelbart, Director of the Stanford Research Institue Augmentation Research Center. Dr. Engelbart is an eminent computer scientist, and a leader in the field of augmentation of the individual human intellect via computer. He has more than 20 years of experience in this field, and brings a maturity that is rare in the comparatively young field of computer science.

While a number of other computer scientists and

researchers are working on segments of the problem of bringing the power of the computer into today's business office (e.g. computerized mail service, stand-alone word processing systems, etc.), Dr. Engelbart is the only one I am aware of who is approaching the total problem of integrating all the parts into a system which is seen by the user as a coherent total service. In order to make use of the individual pieces being developed by others, one would have to learn a different methodology and grammar for each one. The SRI work does not duplicate the research done by others but makes it possible to provide a consistent interface to such work so that it can be integrated into what appears to be one overall system. This may turn out to be the most important part of this proposal, in the long run.

For all of theese reasons, I urge that the National Science Foundation support this proposal.

Ronald P. Uhlig, Ph.D., Chief Materiel Acquisition Systems Division, U. S. Army Materiel Development and Readiness Command, Alexandria, Virginia.

Evaluation

To: File

From: Program Director, Access Improvement

Subject: Interim Evaluation of Staff Augmentation Project

This project was initially funded on June 8, 1976 by an award of $50,600 for support of computer and technical services through January 17, 1977. Purchase of work station equipment subsequently brought the total to $79,450, which was supplemented by $25,000 from the Division of Information Systems.

Instruction of program staff in the new techniques began in July, and productive use of the computer has been evident since September. Procedures have been designed and implemented for computer-based

- drafting and editing
- formatting and printing
- recording of staff activities
- intra-staff communication
- indexing of paper-based correspondence and records
- management control of key events.

Concurrently, as staff members have mastered the resources at their disposal each has devised personalized methods of information production and management.

While the procedures implemented to date are effective and useful, they are far from efficient, imposing a considerable burden on the staff members who carry them out. In the coming year it is planned to build on the basic capabilities achieved so far, largely through automation of actions now performed by the users. Thus the processing of an edited file into a formatted, printed, filed, and indexed letter may require only two or three commands instead of the twenty or thirty needed today.

From the beginning of the project the staff has experienced serious problems with system responsiveness and reliability. The latter problem has taken the form of unscheduled down time, eccentric response to commands, and loss of files.

(In virtually every case of file loss, however, it has been possible within a day or two to recover or reconstruct what has been lost, using procedures established for just that purpose.) There is reason to believe that all of these effects are the result of recent changes in the system hardware and that through normal corrective action they will shortly--if they have not already--become a thing of the past.

The sluggish response which we have experienced, on the other hand, is the consequence of inadequate computer resources for our applications. At the beginning of the project there was no way to say for sure what share of the system's resources would be needed to support the staff's activities. A 3% share was chosen as likely to be in the ball park. It is now clear that more is needed, largely on account of three developments: (i) unanticipated use of the system by the program secretary, (ii) the addition of a fourth professional to the program staff, and (iii) far more intensive professional usage than had been foreseen. (Recent usage has been running at 100 terminal-hours per week, which has the interesting consequence of driving the cost of a terminal-hour down to the vicinity of $10--a practically unheard-of rate.)

We look to three sources for relief from this problem: (i) we have shifted 20% of the staff's workload to hours outside the regular work week, when slack demand on computer resources results in "windfall" resources for those who can use them. (ii) We anticipate that the computer facility will be upgraded in such a way as to double the effective capacity of a given share. And (iii) we are recommending funds for a 4% share of the computer during the coming year. More would be recommended if funds were available.

The enthusiasm with which the program staff embarked on the project has been strained by the problems encountered, but morale remains high and indeed would suffer greatly if we were to lose the resources we have come to depend on.

Everything considered, at this juncture the project must be assessed as highly successful in its primary purpose of familiarizing program staff with augmentation technology, one of the legs on which the Access Improvement Program stands. The secondary purpose of testing the application of that technology in one of the Foundation's program offices is also being realized. Despite this favorable assessment, however, it is likely that the project's greatest accomplishments lie in the future.

Memorandum [0300]

To: File

From: Program Officer

Subject: Evaluation of Workshop Utility Service

Body:

The workshop utility service is a subscription computer utility service established by Stanford Research Institute (SRI) to provide an advanced set of coordinated information handling capabilities including:

. a highly interactive, user oriented, computer interface

. unique text editing, portrayal, and graphics facilities
. document production and control facilities
. teleconferencing among distant geographical locations
. automatic "mail" delivery, cataloging, retrieval and storage
. personal information management (including calendars and complete privacy)
. organizational information management (including financial, personnel, and planning information)

It is the most advanced service available today for automation and offers a full service for every function within an office, while being made available at about half the cost of other systems for each connect hour. The attached report describes in detail the operations being undertaken by the National Science Foundation. I believe it is very important that the National Science Foundation continue to support, along with other government agencies, a system which is at the state-of-the-art.

Incl. Report

c77-03-07
c77-03-04
c77-03-03
c77-03-02
c77-03-01

SNR:

c77-03-31

Dr. Savin
Requested suggestions for EIE reviewers asap.

Ms. Orr, NSB, telecon
Needed words for minutes of the Board discussion of EPC3.

Mr. Hudson, OPRM, telecon
Following up on an inquiry by Appropriations Committee staff about EPC3, triggered by the Kleinschrod letter. I asked Anita to make copies of the Congressional correspondence on the subject available for his use.

Mr. Naughten, DGC
He has assured Mr. Floyd, SRI, that work may continue on EPC2 pending the no-cost extension.

Dr. Carlisle, USC
Explained his current research project to Dr. Bamford, Mr. Custer, and me, over lunch.

Ms. Healy, CAS, telecon
wanted to schedule another meeting on April 27-28. I indicated that the proposers' meeting was not likely to be scheduled that soon.

c77-03-30

Dr. VanNouhuys, SRI, link
The report I requested is being printed. Copies will be mailed next week. He is writing an article based on the report, and asked for suggestions of appropriate journals. [New On-Line Magazines Location: (JOURNAL, JRNL44, J39605:gw)]

Ms. Shelton, DGC
Informed her of the SRI problem; the memo which I had

misdirected to Mr. Wolff was received in Grants only yesterday. Spencer Floyd, the SRI Contracting Officer had already been in touch with Mr. Naughten. She will call me if there is any problem.

Dr. Whitby, SRI, telecon

Called to inquire about no-cost extension. SRI is contract oriented and ready to stop work on Thursday although there is money available to continue through June.

I asked about:

EPC2 - Plans for Participating Journals

COMPUTING REVIEWS - many short items; published monthly

Composition

Accepted manuscripts keyed, corrected, and coded (copy edited) by ACM staff at editorial offices.

CRT terminal (VT71) with small memory used off-line for initial input and editing. Once each day the records are transmitted to the SRI computer and processed through the "typo" program. While the operator is on-line possible errors are reviewed and real errors are identified, after which a corrected copy is printed out for further editing. This editing is done off-line and a corrected record is transmitted to SRI. When the file contains corrected records for all items, ACM staff inserts composition codes.

Full issue files are processed by SRI to produce photocomposition records which can be output through the printing terminal at ACM to produce a variety of surrogates for editorial use.

When copy is approved a complete photocomposed galley is mailed from SRI to the printer who does the paste-up for camera-ready pages.

ACM expects to use this material for actural production, but if pages do not meet specifications the galley surrogate may be used as copy for rekeying by the printer.

Other EPC functions - Reviewer Assignments

Analysis of reviewer assignment system hs been completed and flow charts and documentation for programming are being produced. ACM does not expect to implement the computerized system during the experiment, but computer produced paper aids will be tested.

COMPUTING SURVEYS - long articles; published quarterly

Composition only

Same as REVIEWS except the articles for an issue will be processed in a shorter period so file control will be less complicated.

SOCIOLOGICAL QUARTERLY

Composition only

Editor will supply copy edited manuscripts.

SRI will input material and produce photocomposition record and camera ready pages for printer. (The editor will review the pages, or such surrogates as he deems necessary.)

EPC produced material will be used for the August issue. Printer will do paste-up from galley if automatically produced pages do not meet specifications.

Mr. Strawhorn, CSG, telecon
Asked about material on cumulative monograph. I suggested he talk with Dr. Bamford and reminded him that I was no longer handling the IPG project.

Dr. Bamford
Requested information on EPC2. Reviewed status of EPC3.

c77-03-29

Dr. Burchinal
Review of AIP. Will be continued Thursday at 4.

Dr. Bamford and Dr. Savin
Preparation for Program Review.

Dr. Bamford
He is to brief Dr. Averch on EPC3 on April 5.

Sick Leave
Dental appointment; 1 hour CTU.

Letter to Dr. Honkala *
Re P00739 Location: (DJOURNAL, 39584, 1:w)
Division Of Science Information
Dr. Fred S. Honkala, Executive Director
American Geological Institute
5205 Leesburg Pike
Falls Church, VA 22041
Dear Dr. Honkala:
Dr. Burchinal has asked me to send you some additional information in response to your February 7 letter, inquiring about the Editorial Processsing Center (EPC) project and the outcome of the meeting on December 8, 1976.
As was stated at that time, the next, and final, step in the EPC project will be an operational evaluation of the EPC concept. Although our plans are not yet firm, we expect to solicit proposals in the near future. Copies of the information Hal Bamford and I presented are enclosed. I have also asked the Meeting Coordinator to send you copies of material that was distributed at the meeting and to be sure that you are on the list for future mailings.
There has been considerable misunderstanding about the role of the EPC, particularly as related to the support of authorship. In our view, there would be distinct advantages in an journal's being able to receive manuscripts in several different forms. If this were the case, an author who has available facilities to produce a machine-readable manuscript could submit it in that form. This would save the publisher the time and expense of producing a computer record after it is submitted. Authors and their institutions have traditionally subsidized the communication process--this would be another possible way.
We certainly agree that requiring manuscripts to be submitted in machine-readable form could have an adverse effect on a journal at this time. However, since text-editing systems are already being used in many organizations, a publisher who was prepared to handle manuscripts on tape might find that the number submitted in that form was significant.
I am pleased that AGI is considering an EPC as a possible

solution to its publication problems. However, we do not plan to subsidize the establishment of any specialized EPCs. In fact, one of the factors we will consider in recommending an award for the evaluation project is the diversity of the journals to be processed. Perhaps one of your interested membership organizations should consider joining the operational evaluation project as a participating publisher. This would give your entire group an opportunity for a closer look at the real benefits, and problems of the EPC approach.
Sincerely yours,
Saran N. Rhodes
Assistant Program Director
Access Improvement Program

Letter to Mr. Millson*
Re P00737 Location: (DJOURNAL, 39583, 1:w)
Division Of Science Information
Mr. R. J. Millson
M.E.P. Limited
P. O. Box 24
Northgate Avenue
BURY ST. EDMUNDS
Suffolk IP32 6BN
Dear Mr. Millson:
Dr. Bamford has asked me to respond to your February 28 letter regarding the Editorial Processing Centers.
The Foundation has supported several projects to investigate the potential of the EPC concept, and we are currently considering the possibility of supporting an operational evaluation early next year.
The enclosed material will provide some details about these projects. I have asked that copies of several additional documents, prepared for a recent meeting held to discuss our future plans, be sent to you under separate cover.
We appreciate your interest in our program, and if I can be of any further assistance I hope you will let me know.
Sincerely yours,
Saran N. Rhodes
Assistant Program Director
Access Improvement Program
Enclosures

c77-03-28
Dr. Bamford
Program review for Dr. Burchinal and ZBB.
Dr. Montague, Southwest Research and Information Center, Albuquerque, NM
Looking for support--I gave him copies of our brochures and the EIE Program Announcement.
Mr. Wolff, GCO
Has not worked on solicitation because he expected the NSB to stop the project. Will try to get to it soon but cannot give me a schedule because of high priority work on other projects.
Ms. Healy, CAS, telecon
Asked if any action is needed on the EPC3 proposal. I suggested that budgets for the proposers' meeting and for consulting with potential contractors be developed.
We also discussed the purchase order "report" and the final

report for C-656.
Sick Leave
Medical appointment; 2 hours.
c77-03-27
Sick Leave
c77-03-24
Dr. Bamford
Discussed EPC letters, check list for final reports, index concept, next steps for EPC3.
Mr. Custer
Discussions with Dr. Bamford and Dr. Savin about CSG use of Office-1
c77-03-23
Travel
c77-03-22
ACS meeting
c77-03-21
ACS meeting
c77-03-20
Travel to New Orleans
c77-03-17
Presentation to NSB Program Committee
I. Introduction
A. Journals provide the accumulated record of science.
1. They account for 63% of the $8 billion spent annually in the U.S. for STI.
2. They are essential to scientific communication now and will continue to be, but many of them are experiencing financial difficulties.
B. There are more than 4,000 scientific journals in the U.S.
1. 90% have less than 1500 pages per year (average 500)
2. circulation averages 11,000 subscriptions and ranges from 125 to 600,000 (Scientific American)
3. 79% have less than 5000 circulation; 42% less than 1000.
4. delays between the receipt of a manuscript and its publication range from 1 to 77 months (average 9.2; median 7.3)
B. Technology which could solve these problems is currently used for newspapers and magazines but is not readily available for S&T journals of low volume and complex typography. Editors and publishers are frequently not aware that the technology exists, and have little incentive to change operating procedures until a crisis occurs
C. An EPC could provide such technology to publishers for whom it might otherwise be out of reach.
II. Background
A. The memo which you have received
1. Describes the project's 3 objectives and the 3 lines of research which it brings together
2. Outlines our general approach
3. Sumarizes the schedule and costs of the project from its inception in FY 73 to its final funding in FY79.
4. Discusses the principal issues raised since plans for the project were publicly announced.

B. I am not going to recapitulate, but rather put the project in context.

III. Unusually complex project

A. Numerous and diverse participants

1. Perhaps 10 to 15 participating publishers--many of them inexperienced in the technologies to be applied

2. 1 or more sources of highly sophisticated computer and technical support

3. A contractor whose function it is to provide an EPC to serve as the communication link between the other two groups

B. Addresses the full range of editorial processing - both intellectual activities including interactions with authors and referees, and "manufacturing" activities such as keyboarding, page make-up, proofing, typesetting, through actual printing and distribution. The EPC would serve as a buffer between the users and the technology it employs to serve them.

C. Final portion of a multi-phased project

1. Past work resulting from two previous solicitations

a. design studies - developed concept, cost model

b. Prototype EPCs - Aspen, SRI: 3 journals each

2. Projected work will require the contractor to

a. assemble a group of participating publishers and organize an EPC which will support their requirements

b. analyze the technical and formatting requirements of the individual journals,

c. design, implement, and test a facility that will meet those specifications. Each journal will require less new capability than its predecessors.

d. conduct operational trials - 1 year actual production of about 20 journals

e. evaluate the results - establish scale needed for financial stability, identify a "transportable" EPC package

IV. The project has been publicized widely and the terms of the solicitation are being developed with guidance from the publishing and printing community.

A. There remain uncertainties as to the

1. Nature of the project

a. Participants and precise roles

1. e.g. Source of computer and technical support - ACS or other

b. Details of technical approach

1. e.g. specific services to be provided to each participating publisher or for each test journal

c. Business and management arrangements

1. e.g. EPC charges must be based on a pre-determined formula that provides for sharing savings or increased expenses

d. Precise costs and schedules

2. Outcomes of the project

a. Viability of EPC

1. scale needed for operational stability

b. Impact on market ecology

1. dislocations - how many journals are likely to

change their composition and printing arrangements?
2. opportunities - will aggregation of small publishers open a new market for EPC services?

c. Potential for improved S&T communication
1. faster, cheaper conventional services; automatic production of indexes, specialized bibliographies, collections of related articles, etc.
2. direct use of electronic record - remote access to literature, on-line cumulative and/or multi-discipline indexes, etc.

V. Current Schedule
A. Solicitation issued in April
B. Review, including ARB, July - October
C. Project initiated in January 1978
d. Trials and evaluation completed by June 1981

c77-03-16
Ms. Healy, CAS, telecon
Indicated perferred dates for proposers' meeting: April 27-28; May 25-26; May 18-19; May 11-12.

c77-03-15
Mr. Ashley, NTIS
Requested list of purchasers of the IPG. He will suppply printout. I should call Sue Krimm (557-4634) if there is any delay.

Dr. Burchinal
Preparation for NSB meeting.

Letter to Dr. Honkala*
Re P00739 Location: (DJOURNAL, 39359,)
Division of Science Information
Dr. Fred S. Honkala, Executive Director
American Geological Institute
5205 Leesburg Pike
Falls Church, VA 22041
Dear Dr. Honkala:
Thank you for your recent letter about the EPC project. I am pleased that you are considering participation in the operational evaluation, and I have asked Saran Rhodes, the Project Manager, to be sure that you have all the pertinent materials.
In response to your question, let me say that Fred is not alone in his concern about the loss of editorial control and the stifling of individual initiative. Our saying that the project we are proposing will be specifically designed to prevent any change in editorial responsibility seems to fall on deaf ears, and I really see no way to allay such fears until a demonstration is completed. In the interim, I can only repeat that we belive the EPC will offer an attractive alternative for those journals that are faced with a need to change operating procedures.
Sincerely yours,
Lee G. Burchinal
Director

c77-03-14
Dr. Ezaz, QEI, telecon

Has not yet received notification of no-cost extension. Suggested that I give my comments to Denise Behr if he is out of the office.

Letter to Dr. Honkala
Re P00739
Sent forward to Dr. Burchinal for signature.

c77-03-13
Index
Another less than satisfactory session with this file.

Letter to Scharpf re position paper P00738
< RHODES, DRAFTS.NLS;, 0840> Hal: I'd appreciate your comments.

c77-03-11
Memo and RAD for SRI no-cost extension*
Location: (DJOURNAL, 39306, 1:w)
Mr. Herbert D. Wolff, DGC
Assistant Program Director
Access Improvement Program/DSI
NSF-C75-13214; Stanford Research Institute
The subject grant is scheduled to terminate March 31, 1977. The project has encountered several delays and the Program had planned to extend the grant period when the final funding increment was recommended. However, the Principal Investigator has recently suggested some task modifications that require technical evaluation, which cannot be completed before the scheduled termination date. Since the available funding will permit the project to continue at the current level of effort for several months, I request that the contract be extended to June 30, without additional funds, to allow time to review and process the final funding increment for this project. The RAD for this action is attached.
Sarah N. Rhodes
Attachment

c77-03-10
EPC
Discussion of hazards with Mr. Staiger and Dr. Bamford. Success of the EPC3 project would give the EPC contractor a commanding lead over the rest of the industry and could result in serious impacts on many organizations. Still no better suggestion for how we can help the smaller STI journals use computer technology, or how we can get the publishing/printing community to assume responsibility for for those journals.

Mr. Strawhorn, CSG
I called to pass on Mr. Pronko's information that his application for a travel grant was too late. He indicated that the Israel meeting would not compete with other contract tasks for priority of either time or money. He will withdraw from participation.

Ms. Meyers, CSG
Asked her to send copies of EPC meeting material to Dr. Honkala and Mr. Millson. She will also send me ten more sets.

Ms. Roderer, KRI
Reminded her that we need journal back-up numbers for the NSB meeting. She will call me on Monday.

Mr. McNinch, PRM
Confirmed that his problems with EPC3 are related to two

topics:
1. He feels that we have not done our homework on the project's technical consequences as they relate to the unions and that these could have serious political impact on NSF.
2. He expects flack because the project "is wired in favor of ACS."
He will send me copies of the letters from ABP and Marine Technology.

Ms. Stoltz
Devised an approach to the compilation of reviewer statistics.

c77-03-09

Dr. Whitby, SRI, telecon
Will mail the information I requested this afternoon. Unexpended funds will last to July 1. I will request a no-cost extension noting that the final increment recommendation will be made soon.

Dr. Zuckerman, World Future Society, telecon
Inquired about the status of EPC3. Will send us a letter describing the alternate approach he wants to pursue.

Mr. Burke, Aspen
Described the EPC2 data analysis to Dr. Bamford and me. Expects to submit a draft final report in two weeks. Will develop some comparison figures for use at the NSB presentation, and deliver them next Monday.

Dr. Bamford
The QEI proposal has aged long enough. I agreed to process a final recommendation by April 15.

c77-03-08

Dr. Bamford
Mr. Staiger will be here Thursday. We will meet wth him at 4 to discuss his views on EPC3. Request for statistics.

Ms. Orr, NSB, telecon
Should the EPC item be on the open or closed NSB agenda. Checked with Dr. Bamford and Mr. Frenzen. Open.

Mr. Custer
Office-1 statistics show a continuing increase in efficiency for our slot.

Dr. Lerner, AIP, telecon
She is attending the NFAIS meeting. Called to check on what we are "doing these days." AIP has purchased a Videocomp and will be photocomposing full text soon. The APS experiment continues, but it is unlikely that UNIX will be used in production mode since it is geared for a very slow photocomposer.

Dr. Bowen, ACS
Abstract for IEEE presentation

The Editorial Processing Center - From Concept to Reality

The EPC concept is based on sharing the use of highly automated editorial, production, marketing, and business support systems by a group of publishers large enough to attain useful economies in operation. The EPC is viewed as a way to provide computer support to the publishers of many small scientific journals that are currently experiencing technical and financial difficulties.

Publishers, printers and computer centers have found it feasible and worthwhile to use the computer for virtually

every function which has been contemplated for an EPC. However, no effort has been made to organize a system to support all, or even most, of those functions.
Studies directed toward generalized conclusions about the EPC, in all its organizational and economic complexities, have been supported by the National Science Foundation since 1973. Results from these projects and plans for the future will be discussed.

Bio-resume for Sarah N. Rhodes
Employed by the National Science Foundation since 1957, starting in the Chemistry Program and moving in 1959 to the Office of Science Information Service (now Division of Science Information).
Currently Assistant Program Director for the Access Improvement Program, which includes acting as Manager for the EPC projects.

c77-03-07

Ms. Krevit-Eres, telecon
wants to be brought up to date on EPC and other AIP activities. Scheduled lunch on 03-15.

Mr. Shields, PMO
Took my picture for the IEEE meeting program.

Dr. Tate, CAS, telecon
Wants to reschedule proposers' meeting. Will hold April 27-28, and May 11-12, 18-19, and 27-28 pending clarification of the solicitation schedule.

Ms. Mellette
STIA wanted to know in 15 minutes how many requests for verbatim reviews DSI has received. I could only recall 2 in AIP, and since everyone else was out of the office that is the number we used.

Solicitation
Neither Mr. Wolff or Mr. Frenzen has looked at the draft, but they will try to get together this week and will give me their comments as soon as possible.

Dr. Bowen, ACS, telecon
IEEE has refused to honor his offer of free registration for speakers, so it will cost $75. I suggested that if AIP couldn't afford it I would be glad to withdraw, but that didn't work.

Library
No information about ONLINE or On-Line Review, or the new Elsevier journal.

Dr. Bamford
Confirmed our Wednesday morning appointments. Hal, Bill Burke has a conflict in the morning so I rescheduled for 1:30.

c77-03-06

Catch-up Day
Vouchers, Projectevents, progress reports.

c77-03-03

Drs. Maveret and Robert Singleton, U. Mass.
Delivered a draft of their proposal for a "Centralized Information System." I gave them copies of the Guidelines and suggested that they find out about NASIC via Alan Ferguson at NEBHI in line with Dr. Weiss's comments. They were not familiar wth the Medlars system and had not heard of the SDC

and Lockheed services. They did indicate that they realize that converting old information to computer-readable form is too expensive, so they propose just to start now and build new files!

Ms. Healy, CAS, telecon
She called to confirm that the paperwork reduction numbers are still valid. Will send me a copy of the background data.

Ms. Meyers, CSG
Asked her to send Xerox copies of the slide material to Ms. Selle. I will follow up. Also requested more copies of the handout package since we have none. She told me that the three IPG workshops will all be in Washington.

Ms. Selle, Dartmouth Printing Company
I called to discuss her request for slides used at the Dec. 8 EPC3 meeting. She is particularly interested in the STI schematic that King used.

c77-03-02

Mr. Strawhorn, CSG, telecon
He is planning three meetings: Photocomposition - April 20 or 21; Word Processing - April 13 or 14; and User Advisory Group - April 6 or 7. There will be more information in the next progress report, but he wanted to invite us now to allow us time to plan. The word processing group is generally based in New York, so that meeting may be there. The others will be in Washington.
He has not yet applied for an international travel grant for the meeting in Israel. I told him he may be too late, and that even if there is travel money in the contract it would take special approval to make it available for that trip.
He also asked what our plans are for the next step. I told him Bill would be in touch as soon as he feels ready to take over the project management.

c77-03-01

Mr. Shirley, BMI, telecon
Checking to be sure the draft final report had been received. Asked for a copy of the EIE announcement.

Dr. O'Connor, Lehigh
I called to verify the schedule for his passage retrieval proposal. He plans to submit it formally in September, requesting a September 1978 start date. This is a full year later than we had discussed previously, but he has a HEW project that requires additional time.

Mr. Burke, Aspen
I called to ask about EPC numbers. He indicated that the final report is in typing. Suggested that he come in to talk wth us about the analysis since both time and dollar figures are difficult to evaluate because baseline information is not available. Hal, I have scheduled an hour at 10 am on Wednesday 03-09.

Ms. Singleton, U. of Mass., telecon
She has a proposal for a "centralized information system" and is looking for funding. I tried to get her to mail us a copy but she insists on bringing it in on Thursday.

Dr. Bamford
Reported on his meeting wth Atkinson. Alerted Dr. Cima and me to problems that may come up while he is on leave.

1S2:
c77-03-31
Cook,Truman (SRI)
Spoke to him about San Antonio SRI meeting. Ollie Henslie will call me and make final arrangements for a talk on EIE etc. We may expand program but this has to be worked out.
Donlen, Dr. Roger (NLM)
Received proposal for review. He wanted people in the area of EIE for a visit to Georgia Tech. Gave him the names of M. Turoff, I. Featheringham(NJIT) and I. Mitroff(Pit.).
EIE
Received first proposal from L. Freeman of Lehigh U. Turoff sent mess. by EIE on new cities to be added to TELENET.
Wolff, H.
Spoke to him on sole source memo for Krall proposal. I will have to change but only the intro.
Burchinal
Program review.
c77-03-30
CSG
Meeting with J. Strawhorn on conversion to NLS. Went well. HEB will meet with J. Norton to get some info. on tech. problems but these answers will be the last step needed to negotiate a contract between CSG & SRI. HEB will try and get proposal from SRI to CSG leaving the start up date out.
Abramson, Norman
From the University of Hawii.
Meeting with LC on EIE project and radio transmission of digital data.
Donlen, Roger
From NLM. Spoke with HEB about EIE and proposal from Slamecka, Vladimir(Georgia Tech) which I will review to see if it fits into our announcements area. Will suggest member of panel that will make site visit to GA Tech.
c77-03-29
Burchinal
Program review.
Krall
Working on package. Wrote memo to H. Wolff giving details so he can write a sole source justification.
Brownstein, C.
In RA. They are doing computer conferencing study to see if productivity using system can be measured. Work being done by Jacques Vallee and Robert Johansen of group 72.
Showed him EIE system and asked him to suggest EIE review panel members. We will keep each other informed on how projects are going and he will try and refer projects on EIE to us.
Memo to STIA/ARB↓
Location: < DJOURNAL, 39581.NLS;1, >
James L. Vitol
Executive Secretary, ARB
Program Director, AIP
Program Associate, AIP
Information for the Review of the Innovation Survey project
Enclosed is the information requested for the STIA/ARB review of the program plan for "Continuation of Innovation Survey".

Cost estimates for the 24 months of operation of the project total $355,469 (refer to the Table of Contents, DSI-74-24410-A02 through DSI-74-24410-A09). Using this as the basis of calculation and assuming a constant rate of expenditure, a 12 month extension of the CSG contract would cost about $180,000. A more realistic calculation, allowing for a 6% rate of growth for expenses due to inflation, estimates the 12 month extension to be about $200,000.
William Savin

c77-03-26

IPG

Review and rewrite of memo to Vitol. Package is finished, will go via HEB to STIA/ARB on 3/28.

EIE

Review of Conference 72. R. Hiltz has informed us that a final report is about to be started. On 3/1 an on-line conference will be held but I will not be in the office. Is anyone going to join the conference on that day?

Krall

Review of material in Program Officers Handbook. Starting to put final package together.

EIE PANEL

List of areas to included on review panel plus some possible members sent to AIP staff by Journal Mail. Please comment as soon as possible.

c77-03-25

IPG

Put together full package for STIA/ARB. It has been reviewed by LC and sent to HEB for comment. J. Vitol would like package by 3/28. Review by ARB has been scheduled for next meeting.
LC noted that budget for the 12 month extension seems high but this was calculated from the present rate of spending.

Burchinal

Review of his article. Made comments but seemed ok.

Gautreau

Call about book.

STIA Office

Have a key to 1225 so we can use Xerox machine on Sat. & Sun. It will be in the top center draw of my desk.

c77-03-24

HEB & LC

Discussed letter from Applied Communications Research(Mick,C.) re: chron 3/23. Conclusion was that a program (EIE) evaluation might be the way to go. We will meet again next week to discuss this matter.
It might be a good idea also to get more than one proposal in the area and this will be looked at.

HEB

Discussed Krall proposal and letter from the British Library. I will work on Krall recommendation as soon as possible. BL seems to be doing work along the lines of IPG(CSG). HEB will answer letter from M. O'Hare and we will try and foster link between CSG and Jack Meadows of The Primary Comm. Research Center(UK), the researcher doing the BL study to generate the IPG for the UK.

Paris, Alan(ISR)

re:p00537 Talk on EIE project.

CSG

Lunch meeting with HEB, SNR and P. Custer. Spoke of topics HEB will talk to J. Norton about when in Calf.
Will visit CSG on 3/30 with HEB and P. Custer.

IPG

Worked with SNR on files for STIA/ARB. Vitol says to form a summary package giving awards, reviews and recommendations. Started work on Vitol package for ARB.

c77-03-23

IPG

IPG plan will go to STIA/ARB for action. Will put files in order for ARB review. Will ask Vitol how far back records must go. LC thinks they may only need the last action for review but I think they will want full record of project. Will send to ARB via HEB.

Program Managers Course

Sent vita.

Memorandum to Dr. Averch*
re DSI-74-24410
Location: < DJOURNAL, 39456.NLS;1, >

Harvey AVerch
Acting Assistant Director, STIA
Director, Division of Science Information
Program Director
Access Improvement Program
Continuation of Innovation Survey
DSI-74-24410

The purpose of this memorandum is to set forth for your approval a plan for continuation of this Program's Survey of Innovation in Scientific and Technical Communication. In this project the contractor employs a variety of techniques to collect and evaluate information concerning innovative solutions to problems of scientific and technical communication. The resulting files on the state-of-the-art and on individuals active in the field are invaluable to the Program as a basis for planning. Guidebooks based on these files are distributed to potential innovators, who are thus linked both to the sources of innovation and to the program office.

BACKGROUND

Work on this project was first funded in June, 1974, when parallel contracts were awarded to Capital Systems Group, Inc. (CSG) and to Applied Communication Research, Inc. for the independent development of prototype planning guides and implementation plans. When the prototypes were completed in April, 1975 the Foundation convened a panel of expert reviewers to evaluate and compare the results of the two efforts. This panel judged CSG's product to be more likely to satisfy the Foundation's purposes in supporting the project. Thus, CSG has undergone competitive review at two critical points in the project's history: selection for the initial developmental phase, and a run-off competition with the other developmental contractor.

In the autumn of 1975, under an amendment to its original contract, CSG produced and began to distribute 2,000 copies of

its planning guide, entitled "Improving the Dissemination of Scientific and Technical Information: A Practitioner's Guide to Innovation". This planning guide provides publishers, editors, and other potential innovators with practical guidance on possible innovation in (1) the capture, (2) the dissemination and (3) the delivery of STI.

To date, copies of the Guide have been placed in the hands of over 1,200 key individuals, selected on the basis of their ability to introduce changes into the processes and channels of scientific communication. The Guide has been distributed not only to all of the world's major English-speaking countries, but to a number of other countries as well. Several requests have been received to translate the Guide into other languages. In all, copies have been placed with key individuals involved in the science-information programs of 15 foreign countries. Reaction to the project has been both extensive and positive. The Guide has been cited and favorably reviewed in the professional literature, and both CSG and NSF have received laudatory correspondence from well-known figures in the world of scientific communication. In 1975, the Guide received an award in the annual competition of the National Association of Government Communicators. By the critical measure of user reaction, then, the project has been extremely successful.

Underlying the Guide are the files and computerized data bases which CSG maintains on a continuing basis. These resources are used not only as the basis of the published Guide but also in the advisory, referral, outreach, and other clearinghouse services which CSG provides to the Foundation and to readers of the Guide.

Originally, the project's scope was intentionally restricted to innovations related to the primary dissemination of information (i.e., the creation and distribution of the first formal record of science). This restriction was based on the idea of using primary dissemination as a test case, and on the belief (shared by CSG and NSF) that to attempt to address simultaneously so broad a topic as innovation in all aspects of scientific communication would necessarily result in a serious diffusion of effort, degrading the quality of coverage of any one aspect of that system.

From the outset, however, CSG and NSF have agreed that the project should, ideally, branch out to cover additional aspects of scientific communication. The phasing of this process, of course, depended on response to the Guide and on the rapidity with which control could be established over the components of the basic project. CSG is obligated by the terms of its present contract to provide detailed plans for this expansion. In general terms the areas to be added to the project are:

* innovations related to information reprocessing, retrieval and enhancement. The areas of scientific communications to be studied relate to the services provided by secondary distributors (e.g., the producers of abstracts and indexes, publishers of bibliographies and producers of machine readable text).

* innovations related to accessing (identifying and acquiring) STI considered from the viewpoint of the potential individual user and the user's agent. Examples of areas to be surveyed are literature retrieval systems, intermediary services and library automation and development.

PLAN

The project is funded through 30 June 1977. It is planned to continue the project in two phases:

* A sole source extension of the existing contract through 30 June 1978. The sole source extension is necessary to continue this project in an uninterrupted fashion while a contractor is found for a three-year follow-on study.
* Competitive award of a three-year follow-on contract on 28 February 1978. If this award is made to CSG then it will supplement the contract that firm is working on through 30 June 1978. If a new contractor is selected its contract will overlap with CSG's during its first four months of operation. A new contractor will be required to take over and update the files maintained by CSG, serve as a resource to DSI on the state-of-the-art in scientific and technical communications, update and distribute the Guide and expand the project as described above. To do all these tasks while training a new staff will require an overlap with CSG to insure a smooth and orderly transition of the project.

This plan involves the following detailed schedule of events:

* 31 March 1977: Submission by CSG of a plan for the continuation of its work at the present level through 30 June 1978. During this period CSG will continue to update its files and distribute the guidebook, serve as a clearinghouse, and hold workshops in areas related to this project.
* 30 June 1977: Submission by CSG of its report detailing the plans for the expansion of the project.
* 30 June 1977: Award of a continuation contract to CSG.
* 1 August 1977: Issuance of RFP by NSF for a three-year extension of the expanded Innovation Survey.
* 15 September 1977: Receipt of proposals.
* 15 November 1977: Proposal evaluation completed.
* 15 December 1977: Negotiations completed with proposers in the competitive range.
* 30 December 1977: Best and final offers submitted by proposers in the competitive range.
* 15 January 1978: Selection of contractor to carry on the project.
* 28 February 1978: Award of the new contract. Three successive 12 month awards will be made to fund the expanded project.
* 30 June 1978: Termination of the CSG continuation contract.
* 28 February 1979: First continuation award. A program review will be held before this award is approved.
* 28 February 1980: Second continuation award. A program review will be held before this award is approved.

Should it seem desirable to continue the project beyond the three-year period contemplated at this time, the Program would

expect to follow a procedure similar to the one outlined here, with the added possibility that the distribution of products based on the Survey files might be spun off and continued as a commercial venture.
RECOMMENDATION
This plan has been discussed with Mr. Vitol and with Mr. Wolff of the Division of Grants and Contracts.
Your approval is recommended.
Harold E. Bamford

Letter to Mr. Thomas R. Buckman*
p00535
Location: < DJOURNAL, 39441.NLS;1, >
Division Of Science Information
Mr. Thomas R. Buckman
The Foundation Center
888 Seventh Avenue
New York, NY 10019
Dear Mr. Buckman:
Enclosed is the program announcement you requested on "Operational Trials of Electronic Information Exchange for Small Research Communities".
In your letter you described several possible projects which I believe could fall within the guidelines detailed in the announcement. If you have any questions concerning the development of a proposal I would suggest that you speak with Dr. William Savin (202-632-5800), the DSI staff member who will be handling these projects.
If we can be of any further assistance to you please do not hesitate to contact us. Thank you for your interest in our program.
Sincerely yours,
Lee G. Burchinal
Director
Enclosure

Declination letter on Battelle*
Location: < DJOURNAL, 39440.NLS;1, >
Division Of Science Information
Mr. Frank Lukz
Contracting Officer
Battelle Memorial Institute
Columbus, OH 43201
Dear Mr. Lukz:
We regret to inform you that the National Science Foundation is unable to support you proposal entitled "Options for Improving the Compilation, Dissemination, and Use of Directories of Scientific and Technical Information".
In evaluating each proposal submitted to the Foundation, a number of factors are considered. They include the following: the scientific merit of the proposal and its merit in relation to other proposals received by the Foundation in the same general field of investigation; the distribution among fields of investigation within the program of the Foundation; the geographical distribution of support by the Foundation; and, finally, the funds available for the support of projects. Thus, many excellent proposals cannot be supported for reasons aside from intrinsic merit, although this is an important

consideration.
Even though we are unable to support this proposal, we would be pleased to consider other proposals which you might wish to submit.
Sincerely,
Lee G. Burchinal
Director
cc: Robert Kohn

Letter to R. L. Snyder#
Location: < DJOURNAL, 39431.NLS;1, >
Division Of Science Information
Mr. Richard L. Snyder
Roche Institute of
Molecular Biology
Nutley, NJ 07110
Dear Mr. Snyder:
As per our discussion of March 16, 1977, I am enclosing some of my ideas on scientific communications and the electronic media. If the program committee for the next SRA meeting in San Antonio finds these ideas interesting, I will be glad to speak with them concerning the full development of these topics into a program. I believe scientific communications is a relevant area for the society and the members will find it interesting and stimulating.
Topics which might be included in a general session on scientific communications and the electronic media are:

1. A review of NSF research in the area of scientific communication
2. Computer conferencing and electronic information exchange
3. Word processing
4. Alternatives to conventional publishing
5. The future of computer base information systems

These are a few general areas which could be developed by people doing communications research into what I think would be an interesting session. Though the topics are general and probably would have to be made more specific by the speakers chosen, I think they give the general flavor of the types of areas which might be discussed.
As requested, I have enclosed my resume which is six months old and I have had to correct by hand. I would be glad to speak to you further concerning this matter.
Sincerely yours,
William Savin
Program Associate
Access Improvement Program

NLS
J. Beck has tried to fix the SPELL PROGRAM. I have a new version of OSPELL in file ABC. Try it you may like it. <.d:w1>
4-MAR-77 1436-PST BECK: BAD File SPWK.nls;58
Distribution: SAVIN, lieberman, beck
Received at: 4-MAR-77 14:36:47-PST
OK, bad file fixed. New good version is spwk.nls;60
....jeanne
15-MAR-77 1038-PST SAVIN: SPELLINNG CORRECTION PROGRAM

Distribution: BECK, LIEBERMAN, savin
Received at: 15-MAR-77 10:38:07-PST
I have used the program again today and find again that the file created is BAD. Can you give me any help. The bad file is Savin, SPWK.

15-MAR-77 1740-PST SAVIN: SPELLING CORRECTION PROGRAM
Distribution: BECK, LIEBERMAN, savin
Received at: 15-MAR-77 17:40:02-PST
Tried the program again and it seemed to work. Do not understand.
Can you tell me if anyone else is having problem with the program?

17-MAR-77 0940-PST BECK at OFFICE-1: Spell problems
Distribution: SAVIN, LIEBERMAN, BECK, FEEDBACK
Received at: 17-MAR-77 09:40:23-PST
Message-ID: <[OFFICE-1]17-MAR-77 09:40:16-PST.BECK>
well, the problems you're having with Spell don't seem to be happening
to others right now. I want to get a little more information about the
procedure you use.
which branch do you Process?
Do you do this in TNLS, Display NLS, or do you start out in DNLS and
then Simulate TNLS?
Does there seem to you to be any common characteristics about the times
when Spell fails for you?
what we might do is have you run Spell some time while you are linked to
someone here to see if we can catch something.
The next time Spell fails, just check to see if Vannouhuys, Beck,
Lieberman, Feedback are online at the time and link to one of them to
show them what state things are in. You could also telephone Rob or me.
We should try to catch it in the act.

18-MAR-77 0539-PST SAVIN: SPELL
Distribution: BECK, savin
Received at: 18-MAR-77 05:39:58-PST
I run spell program in TNLS because I have had problem getting a final output file at times. I have run program twice since I mess. you and it was ok so it could have been me that is the problem.
If you want to check PB I run it is savin,abc,ospell.
Thanks.

18-MAR-77 0721-PST SAVIN: SPELL
Distribution: BECK, savin
Received at: 18-MAR-77 07:21:59-PST
Just ran spell program again and it seemed to work but I had two error and one system reset needed. I was in DNLS.Again this could have been net etc. and not program problem.

19-MAR-77 0631-PST SAVIN: SPELL PROGRAM
Distribution: BECK, savin

Received at: 19-MAR-77 06:31:36-PST
I ran program again today and it told me I had an Illegal inst. and left me in TENEX. I was in DNLS.
I have no question now that this program is not working for me. If you can get me next week I'll run it for you.
PS. Trouble always starts after checking and while making new file.

19-MAR-77 0835-PST SAVIN: SPELL INFO
Distribution: BECK, savin
Received at: 19-MAR-77 08:35:16-PST
I can give you some more info on spell program.
1. If no corrections are made I have the problem.
2. When it gets back into PB and does an Update Plex-and says it is not needed that is where it seems to hang up.
3. Message is Illeg TENEX source/destination designator.
Sorry to keep doing this but I use this program often and would like to have it back.

21-MAR-77 1105-PST BECK at OFFICE-1: Change OSPELL
Distribution: SAVIN, LIEBERMAN, BECK
Received at: 21-MAR-77 11:05:48-PST
Message-ID: <[OFFICE-1]21-MAR-77 11:05:43-PST.BECK>
Okay, so the update hangs it up when there's been no changes made. In
fact, the version of the process branch that Dirk runs successfully
every day executes the update file step BEFORE running SPELL (although
he says he's never had no spelling changes needed!).
Thus, I have changed the order of the commands in the process branch at
<USERGUIDES, SPELLING-CHECKER-GUIDE, ospell> to be identical with
Dirk's. You can either re-copy <SAVIN, ABC, ospell> from that new
version, or just move the "upd fil" step to follow the "jum ite" step in
your copy (from fourth to second step).
Now, this change should THEORETICALLY NOT change what it does, but I
think it may circumvent the hangup we don't fully understand. Why don't
you try the modified PB on some file that doesn't need any spelling
changes, and let me know if it's more successful.
Thank you for your patience with the SPELL problems.

MITRE tip down most of the morning but I am able to use the NBS tip in this.

Mick, Colin K.
Re: p00751. Applied Communication Research
Proposes to develop a common evaluation methodology for all teleconferencing experiments, establish a central teleconferencing evaluuation clearinghouse and provide update reports.
I think this study is not needed now. If we see that the projects are not able to assess themselves we can seek a

contractor to help with assessment.

c77-03-22

Wolff, H.
Informed me he and Mike Kenefick approve of IPG plan.

Burchinal
Meeting of DSI staff to prep us for meeting with Dr. Harvey Averch, the new Acting Assistant Director for STIA.

HEB2
Meeting with LC to review paper written by Averch and plan AIP presentation for pm meeting with Averch.

Averch
Meeting with DSI staff at which each Program talked of the research it is supporting. I spoke for about 2min. on EIE.

Miller, Ruth
From Portland State. She thinks they may have a proposal on TA by the end of the month. If they do not have support info in time I told her to contact me.

Chron
Please update your chron files before you logout.
Had problem printing Chron files today because the system was down when I could get on it.

c77-03-19

EIE
Worked on Review Panel.

Strawhorn
John and I spoke of the problems he sees with the conversion to Office-1 for IPG study. The following are some facts he gave me and some questions which still need to be answered.
Data tapes of Word-1 files(eXamples not full files) have been sent to J. Norton. These had RANN files and Human Resources file as examples. I told him to send other IPG files including the Guide so output to print could be looked at. These files will be to Norton before HEB gets to SRI>
John still needs to know about the type of type composer service Office-1 will provide for CSG. They need to know about how long output for printing will take to get to them, if scientific characters are available and if the can get single page make-ups?
CSG needs to know what is involved in the file conversion and how much of the system they will need for their work.
The tax problem raised by RANN(Jack Talmadge) needs an answer. The fact that SRI charges a fee and pays no taxes has them worried. CSG can have a problem I am told if they do business with SRI and SRI is found to have a tax problem. This question needs to be answered by a member of the SRI legal staff and I think when HEB visits Norton they should meet with the person who can draft a replt to this question for CSG.
SRI needs to act to answer these question for CSG in the near future. HEB should make this point with them if we hope to get CSG on the system.

Burchinal
Draft of letter to Thomas Buckman. AS will output and send to Burchinal via HEB.

EIE
I am not noting who we are sending Announcements to but a list

is in <STOLTZ, EIE/ADDRESSES.NLS;,>.

c77-03-18

Konn

LC reviewed Battelle rejection and had me redraft letter(sent to the wrong man), add PIP and put in flags.
Revised package sent to Burchinal.

S. Ogleby(GW)

Meeting on EIE.

STIA

Meeting at which Dr. Atkinson announced Dr. Harvey Averch will assume, effective immediately, the position of Acting Assistant Director for STIA. Dr. Averch will continue as Assistant Director for Science Education..
Dr. Atkinson asked that the meeting be very open but nobody seemed to have anything to say or ask. I did not understand why.

IPG

Final version signed by LC and sent to Burchinal.
H. Wolff was out and did not review.

c77-03-17

Letter to Connolly+

Location: < DJOURNAL, 39407.NLS;1, >

Division of Science Information
Mr. George C. Connolly, Jr.
Office of Special Programs Development
New London Laboratory
Naval Underwater Systems Center
New London, Connecticut 06320
Dear Mr. Connolly:
At this time, no further information is available from the National Science Foundation regarding the Program Announcement, "Operational Trials of Electronic Information Exchange for Small Research Communities", but as stated in the document we would be glad to answer any specific questions you might have concerning the development of a proposal. The announcement will be applicable for at least two years and there is no closing date for proposals. This is the first call for proposals and, therefore, there are no reports of earlier phases of the program. I would like to call your attention though to the reference on page 10 of the announcement which do provide an extensive background on Electronic Information Exchange.
Thank you for your interest in our Program and please do not hesitate to contact us with any specific questions you might have.
Sincerely yours,
William Savin
Program Associate
Access Improvement Program

IPG

Memo to Granger changed by HEB and now in final form. Given to AS to output.
No comments from H. Wolff(DGC), was not in.

EIE

went over criteria for selection of Review Panel for EIE Trial Project Proposals.

Travel

Spoke to NJIT about payment for travel. I may go broke before this is worked out.

Kohn

Finished paper work for the rejection of the Battelle proposal "Options for Improving the Compilation, Dissemination, and Use of Directories of STI".

Excerpts from reviewers' comments

IMPACT

Basically, the proposal is too vague regarding the expected outcome of the effort. The object of the research program as stated on page 3 says "...to provide guidance for more effective use and compilation of future directories ...". In the section on anticipated results on page 7, the proposal states that "The proposed research program is expected to produce several results that will be of value to ...". However, the only specific example cited is that of preparing "good" and "weak" directories. Recommendations are also alluded to but not specified in terms of real value. No solid rationale is stated for doing the study nor benefits cited as an outcome of the study.

The proposal does not present enough substance to permit meaningful evaluation. Directories of STI are clearly an important tool for STI dissemination and a study of such directories is warranted. A carefully implemented study in this area could lead to meaningful recommendations for directory improvement or as a minimum provide some evidence of directory utilization and value. Whether these results will come from the Battelle proposal is not clear.

It seems to this reviewer that the study proposed has some value and importance based on the fact that information sources seem to be continually expanding and directories which identities sources and the nature and availability of the information they purvey can be quite useful. On the other hand, however, it is unclear to this reviewer how the preparation of directories related to science information and an analysis of reaction from a wide range of user classes will contribute materially towards determining options for future directory publications and/or provide information on the value of preparation other than by conventional hard copy.

METHODOLOGY

The proposal states that the investigators will query a number of classes of users, but it is not clear from this write up whether they are concerned with the question of why the directories are prepared by these various groups or only with response of these groups to directories prepared by various groups. The population to be surveyed seems to be a mixture of preparers and users. If it is only the latter, then it seems to me that the questions and approaches which have been prepared for each group are quite different and probably rightfully so, but I fail to see how a uniform set of questions will be obtained.

This proposal is poorly written and tells little about the methodology of the study. The end product for determination is not spelled out sufficiently to justify doing the work.

The proposal does not indicate the number of people in each category who will be questioned or interviewed. Nor does the proposal give any information of the type of questions that will be asked. Further, it is not entirely clear from the proposal how the subjects will be selected. Interviewing producers and compilers of directories to learn the value of the directories produced is nearly useless. The technical approach seems weak. The survey is to be conducted in three segments of interest in seven types of organizations. Anticipated results are given, with no indication of the analysis to be made of the data collected. While the research plan proposes a typical survey approach, it does not adequately show full consideration of basic survey methodology; i.e., probability or non-probability sampling, definition of the universe being studied, definition of the variable being studied, sample design.

JUSTIFICATION

This proposal, regardless of whether or not it is consistent with AIP, has failed to thoroughly justify the need for such a study.

Both the research plan and its anticipated results seem somewhat vague. Certainly it did not list sufficient evidence that will warrant the expenditure of $50,000.

c77-03-16

IPG

Memo to HEB. H. Wolff did not get me his comments but I will try again on 3/17.

EIE

Chose experties I think are needed for EIE review panel. Will review with HEB.

Spoke to Turoff about panel and he thinks areas are ok and will send names of experts he thinks may help review proposals.

Murray says we will have about 10 proposals by 4/1.

Recieved my second phone call from a man who had not received the announcement even though his name is on the mailing list(so announcement was sent). Mail service seems to be very bad.

Kohn

Review of material for Baattelle proposal rejection.

Snyder

Member of SRI and wants details of possible session for meeting in Oct. Will try and write this week.

Stoltz

Used the Qualterm tape unit for the first time to do a group of form letters. Worked well and did not have to use NLS after the letter was outputed to tape. Anita thinks she has some ideas to experiment with which may improve system but all systems are go for now.

PS. It is easy to use the tape unit.

c77-03-15

Letter to Mr. James Rockford*

< DJOURNAL, 39347.NLS;1, >

Division Of Science Information

Mr. James Rockford

Superintendent of Police

Chicago Police Department

1121 South State Street

Chicago, IL 60605
Dear Mr. Rockford:
While attending a meeting of the American Physical Society held at the Palmer House Hotel in Chicago, Illinois, a Mr. Morris Simms the operator of a limousine service, misrepresented himself as cab driver and took a group from the APS meeting to North Lincoln Avenue and overcharged us $10 for the ride. Through the Palmer House Security Office, we lodged a complaint about Mr. Simms' action. This matter was turned over to Officer Thomas Carroll (Star #9048) who contacted Mr. Simms and was able to obtain a $10 refund for said ride.
I wish to thank the Chicago Police and in particular Officer Carroll for his help in this matter. As a visitor to Chicago, I am impressed with the service rendered by its fine police department. I must admit I was not originally hopeful that this matter would receive the attention needed to bring it to a satisfactory conclusion. But I see that men such as Officer Carroll and the other members of your fine department do see a need to keep a major convention city like Chicago free of the types of problems Mr. Simms could cause.
Thank you again for your assistance in this matter.
Sincerely yours,
William Savin
Program Associate
Access Improvement Program

Letter to Porter Parris*
< DJOURNAL, 39346.NLS;1, >
Division Of Science Information
Mr. Porter Parris
General Manager
Palmer House Hotel
17 East Monroe St.
Chicago, IL 60690
Dear Mr. Parris:
I am writing to express my deep appreciation for the service extended by two of your security officers, Mr. Robert Fehrman and Mr. John Bogue. During my recent trip to the general meeting of the American Physical Society held at the Palmer House Hotel, a Mr. Morris Simms representing himself as a cab driver took four other convention attendees me and to North Lincoln Avenue and charged us $15 for what would normally be a $5 cab ride. Mr. Simms informed us that he was not operating a cab but rather was representing a limousine service. Upon my return to the Palmer House, I notified Security Officer Robert Fehrman of what had transpired. He and Mr. John Bogue, with the help of the Chicago police, were able to obtain a $10 refund from Mr. Simms.
The services provided by the Palmer House Security Office I feel were extraordinary. I have always enjoyed my stays at the Palmer House and this experience only helps to reinforce my feelings that your hotel is one of the finest establishments I have had the pleasure to frequent.
Thank you again for helping me with this matter.
Most sincerely,
William Savin
Program Associate

Access Improvement Program

Burcninal

Xerox of info for chapter.

c77-03-14

IPG

Worked on draft HEB gave me on 3/12.

c77-03-13

Burcninal

Reviewed the information CSG provided for his chapter. Will Xerox part of the information provided and I hope this will end this project for me.

c77-03-12

Kohn

Completed the paper work on the rejection of the Batell Lab. proposal. Given on tape to AS.

HEB

Went over the latest version of IPG continuation plan. He didn't like it and will redraft. I will work on it at home so we can have a version early next week. I can not follow the dates for the project and will have to H. wolff(DGC) to see if contracts will give me the info needed. SNR- Can you see me on 3/14 on this?

NIH

Went to final report made by NJIT group to Commission on Biomedical Research and Tech. I had worked on this project for almost 14 months and wanted to see the final output. ZMeeting lasted untill 5pm and the Comm. is still interested in having more discussion on the project. I will get copy of the final report if anyone is interested.

c77-03-11

IPG

Copy give to Wolff(DGC) and HEB. Memo to Granger on tape but not input as AS had problems with Custer travel request and had to work on that.

EIE

Announcements seem to have been found. New box in my office.

Projectevents

Updated the file as per notes from HEB.

Strawhorn

Received information for Burchinal book chapter. Will review and reproduce what I think will be of value in writting chapter.

Talked of EIE and he said that the terminal they are using they are having problems getting into system with (may be TELENET) and I told him I would inform Turoff and would try and look at terminal when I return the material he gave me. Note that D. King uses the same terminal and has the same problem.

Burchinal

Reviewed info I gave him for his chapter and asked for full articles in two areas I had just given him highlights. Also gave him an article by King Research titled "Some Preliminary Comments Concerning STI". I have a copy if anyone wants to see it.

Connoly

Draft of letter on EIE questions.

c77-03-10

ASIDIC
Will not be going to meeting in Atlanta, GA (March 13-15).

IPG
New draft of plans to be sent to STIA.
Can be found in <SAVIN, IPG4.NLS;,:w1>
Covering memo to Granger also being drafted. Will speak with Wolff(DGC) to show him what we are going to send to STIA.
Had to input at home.

Kohn
Started the paper work to reject the Battelle proposal "Options for Improving the Compilation, Dissemination, and Use of Directories of STI".
Spoke with LC and got model to follow. I also have the Program Officers Handbook and will use this as a reference.

Krall
Gave copy of revisions to HEB for comment.

c77-03-09

NFAIS
Morning plus lunch.
Gave talk on EIE. Went well. Meet H. W. Koch of AIP who thinks we can put a notice in PHYSICS TODAY on EIE Trial Projects. People seemed interested in system but may not have seen the possibilities for A&I. Spoke with William Baker (Bell Labs) about UNIX. We should find out about this it is a very good system for word proc.

EIE Announcement
Stock seems to have lost 2500 copies of the announcement. I got 30 copies from CF who now have about 550. Stock and Mail Room (who had all copies to start with) are all looking.

IPG
Worked on new draft.

Custer
Will be using the ASPEN terminal. Needs the wide paper feature.

c77-03-08

Science Information Activities Task Force
Went to the morning meeting and found it interesting.

IPG
Went over HEB comments and started to re-draft the section detailing the future plans.

NFAIS
Worked on talk to be given on 3/9. This is the final version!

HZ 2000
Terminal now has upper and lower case letters and line printer.

c77-03-05

NLS
Had problems with SPELLING PROGRAM in that it gets into a loop and will not exit. Informed J. Beck because Rob was not in. Will keep you all informed.

NFAIS
Worked on talk to be given on 3/9. Hal- Will you talk to me on 3/8.

EIE
Worked on trying to understand CON. 72. Printed out the last 40 messages and tryed to see what information is in this group of 110 comments. I do not yet know what most of the people are

talking about but they sure like to type!! If anyone wants to see the output of an active computer con. it will be in my office.

c77-03-04

EIE

Ordered another box of the announcements from stock (Richard Wheeler).
Turoff sent me EIE message that he has checked on proposals and thinks thatwe will get about 10 by the end of the month but we will have a much larger group by the end of April. He did not give me anyone to speak to and the group we mailed to is 150 names long. Will speak to him again next week.
Sorted mailing list for EIE by making a filter that looked at last name on first of address. Can be seen as a PB in <savin, abc.nls;,psort>.

Cima

Information for Turoff

3-MAR-77 1636-PST SAVIN: TIP NUMBERS IN NEWARK
Distribution: CIMA, savin
The tip numbers in newark are: 201/932-2750 & 201/821-8085.

Custer

Will get info for Bill Dennis on Office-1.<.d:w1>

2-MAR-77 1250-PST SAVIN: Information on Office Automation
Distribution: LIEBERMAN, savin
Bill Dennis of NSF is doing an article on OFFICE AUTOMATION and would like as many references as you or the other SRI might be able to provide.
I think this might be a good place to show the NSF what this area has to offer. If you have any questions please contact me.
THANKS

J. Ennis

Down from NJIT to visit at NSF. Had lunch.

c77-03-03

Custer

Info for Turoff- Paul thinks EIE-Office 1 interface should be in TENEX and I think he is right. LC will send TENEX Guide, tip numbers, etc. to Murray on Friday.

CSG

New version of future plans <SAVIN,IPG2.NLS;,> to be typed by AS. Also updated PROJECTEVENTS.
Spoke to Strawhorn about project and possible info for Burchinal.

Burchinal

Review of ideas for his chapter on electronic pub. Showed him what I had done and told him I would speak with D. King.

Power Shut Off

No power on Sat. in office so will work at home. Will be able to use NLS and fix final version of my talk for 3/9.

c77-03-02

Burchinal

went to other Divisions to speak of EIE and to see if he could speak to them on how they might get NSF research projects to use system. It seems that he was well reveived and will speak to many of the program directors at Division meetings.

ANS
Letters to be put into drafts.
Helped her with filters and looking for PC's draft of SRI package in CJOURNAL.
IPG
Rewrite and review by SNR. Will try another draft.
EIE
Message to Turoff on who are best bets to get us a proposal this month.
Sent 2 more announcements and gave Burchinal about 30. LB seems to be sending out quite a few of the announcements.
ASIDIC
Made res. for meeting.

c77-03-01

Program Managers Course
Will go to first session April 18-22.
EIE
HEB2 informed me that we will need EIE Trial Project proposals by the end of March if we are to fund them this FY. Will try and speak to groups we know are going to submit proposals.
Herb Wolff
Spoke to him on CSG extension. They signed last week. I told him we will submit a plan to DGC for comment which will detail how this project will be continued over the next 8 years.
NJIT
Sent them my expenses for AAAS Denver trip.
EIE Announcement
Checked with Mail Room and found that it was mailed 10 days ago. Allentuch at NJIT has received his copy.
Mail
Went through a weeks mail.

Evaluation

To: File
From: Program Director, Access Improvement
Subject: Interim Evaluation of Staff Augmentation Project

This project was initially funded on June 8, 1976 by an award of $50,600 for support of computer and technical services through January 17, 1977. Purchase of work station equipment subsequently brought the total to $79,450, which was supplemented by $25,000 from the Division of Information Systems.

Instruction of program staff in the new techniques began in July, and productive use of the computer has been evident since September. Procedures have been designed and implemented for computer-based

- drafting and editing
- formatting and printing
- recording of staff activities
- intra-staff communication
- indexing of paper-based correspondence and records
- management control of key events.

Concurrently, as staff members have mastered the resources at their disposal each has devised personalized methods of information production and management.

While the procedures implemented to date are effective and useful, they are far from efficient, imposing a considerable burden on the staff members who carry them out. In the coming year it is planned to build on the basic capabilities achieved so far, largely through automation of actions now performed by the users. Thus the processing of an edited file into a formatted, printed, filed, and indexed letter may require only two or three commands instead of the twenty or thirty needed today.

From the beginning of the project the staff has experienced serious problems with system responsiveness and reliability. The latter problem has taken the form of unscheduled down time, eccentric response to commands, and loss of files. (In virtually every case of file loss, however, it has been possible within a day or two to recover or reconstruct what has been lost, using procedures established for just that purpose.) There is reason to believe that all of these effects are the result of recent changes in the system hardware and that through normal corrective action they will shortly--if they have not already--become a thing of the past.

The sluggish response which we have experienced, on the other hand, is the consequence of inadequate computer resources for our applications. At the beginning of the project there was no way to say for sure what share of the system's resources would be needed to support the staff's activities. A 3% share was chosen as likely to be in the ball park. It is now clear that more is needed, largely on account of three developments: (i) unanticipated use of the system by the program secretary, (ii) the addition of a fourth professional to the program staff, and (iii) far more intensive professional usage than had been foreseen. (Recent usage has been running at 100 terminal-hours per

week, which has the interesting consequence of driving the cost of a terminal-hour down to the vicinity of $10--a practically unheard-of rate.)

We look to three sources for relief from this problem: (i) We have shifted 20% of the staff's workload to hours outside the regular work week, when slack demand on computer resources results in "windfall" resources for those who can use them. (ii) We anticipate that the computer facility will be upgraded in such a way as to double the effective capacity of a given share. And (iii) we are recommending funds for a 4% share of the computer during the coming year. More would be recommended if funds were available.

The enthusiasm with which the program staff embarked on the project has been strained by the problems encountered, but morale remains high and indeed would suffer greatly if we were to lose the resources we have come to depend on.

Everything considered, at this juncture the project must be assessed as highly successful in its primary purpose of familiarizing program staff with augmentation technology, one of the legs on which the Access Improvement Program stands. The secondary purpose of testing the application of that technology in one of the Foundation's program offices is also being realized. Despite this favorable assessment, however, it is likely that the project's greatest accomplishments lie in the future.

Memorandum [0300]

To: File
From: Program Officer
Subject: Evaluation of Workshop Utility Service
Body:

The workshop utility service is a subscription computer utility service established by Stanford Research Institute (SRI) to provide an advanced set of coordinated information handling capabilities including:

- a highly interactive, user oriented, computer interface
- unique text editing, portrayal, and graphics facilities
- document production and control facilities
- teleconferencing among distant geographical locations
- automatic "mail" delivery, cataloging, retrieval and storage
- personal information management (including calendars and complete privacy)
- organizational information management (including financial, personnel, and planning information)

It is the most advanced service available today for automation and offers a full service for every function within an office, while being made available at about half the cost of other systems for each connect hour. The attached report describes in detail the operations being undertaken by the National Science Foundation. I believe it is very important that the National Science Foundation continue to support, along with other government agencies, a system which is at the

state-of-the-art.
Incl. Report
c77-03-07
c77-03-04
c77-03-03
c77-03-02
c77-03-01

SNR:
c77-03-31
Dr. Savin
Requested suggestions for EIE reviewers asap.
Ms. Orr, NSB, telecon
Needed words for minutes of the Board discussion of EPC3.
Mr. Hudson, OPRM, telecon
Following up on an inquiry by Appropriations Committee staff about EPC3, triggered by the Kleinschrod letter. I asked Anita to make copies of the Congressional correspondence on the subject available for his use.
Mr. Naughten, DGC
He has assured Mr. Floyd, SRI, that work may continue on EPC2 pending the no-cost extension.
Dr. Carlisle, USC
Explained his current research project to Dr. Bamford, Mr. Custer, and me, over lunch.
Ms. Healy, CAS, telecon
Wanted to schedule another meeting on April 27-28. I indicated that the proposers' meeting was not likely to be scheduled that soon.
c77-03-30
Dr. VanNouhuys, SRI, link
The report I requested is being printed. Copies will be mailed next week. He is writing an article based on the report, and asked for suggestions of appropriate journals. [New On-Line Magazines Location: (JOURNAL, JRNL44, J39605:gw)]
Ms. Shelton, DGC
Informed her of the SRI problem; the memo which I had misdirected to Mr. Wolff was received in Grants only yesterday. Spencer Floyd, the SRI Contracting Officer had already been in touch with Mr. Naughten. She will call me if there is any problem.
Dr. Whitby, SRI, telecon
Called to inquire about no-cost extension. SRI is contract oriented and ready to stop work on Thursday although there is money available to continue through June.
I asked about:
EPC2 - Plans for Participating Journals
COMPUTING REVIEWS - many short items; published monthly
Composition
Accepted manuscripts keyed, corrected, and coded (copy edited) by ACM staff at editorial offices.
CRT terminal (VT71) with small memory used off-line for initial input and editing. Once each day the records are transmitted to the SRI computer and processed through the "typo" program. While the operator is on-line possible errors are reviewed and real errors are

identified, after which a corrected copy is printed out for further editing. This editing is done off-line and a corrected record is transmitted to SRI. When the file contains corrected records for all items, ACM staff inserts composition codes.

Full issue files are processed by SRI to produce photocomposition records which can be output through the printing terminal at ACM to produce a variety of surrogates for editorial use.
When copy is approved a complete photocomposed galley is mailed from SRI to the printer who does the paste-up for camera-ready pages.
ACM expects to use this material for actural production, but if pages do not meet specifications the galley surrogate may be used as copy for rekeying by the printer.

Other EPC functions - Reviewer Assignments
Analysis of reviewer assignment system hs been completed and flow charts and documentation for programming are being produced. ACM does not expect to implement the computerized system during the experiment, but computer produced paper aids will be tested.

COMPUTING SURVEYS - long articles; published quarterly
Composition only
Same as REVIEWS except the articles for an issue will be processed in a shorter period so file control will be less complicated.

SOCIOLOGICAL QUARTERLY
Composition only
Editor will supply copy edited manuscripts.
SRI will input material and produce photocomposition record and camera ready pages for printer. (The editor will review the pages, or such surrogates as he deems necessary.)
EPC produced material will be used for the August issue. Printer will do paste-up from galley if automatically produced pages do not meet specifications.

Mr. Strawhorn, CSG, telecon
Asked about material on cumulative monograph. I suggested he talk with Dr. Bamford and reminded him that I was no longer handling the IPG project.

Dr. Bamford
Requested information on EPC2. Reviewed status of EPC3.

c77-03-29

Dr. Burchinal
Review of AIP. Will be continued Thursday at 4.

Dr. Bamford and Dr. Savin
Preparation for Program Review.

Dr. Bamford
He is to brief Dr. Averch on EPC3 on April 5.

Sick Leave
Dental appointment; 1 hour CTU.

Letter to Dr. Honkala *

Re P00739 Location: (DJOURNAL, 39584, 1:w)
Division Of Science Information
Dr. Fred S. Honkala, Executive Director
American Geological Institute
5205 Leesburg Pike
Falls Church, VA 22041
Dear Dr. Honkala:
Dr. Burchinal has asked me to send you some additional information in response to your February 7 letter, inquiring about the Editorial Processsing Center (EPC) project and the outcome of the meeting on December 8, 1976.
As was stated at that time, the next, and final, step in the EPC project will be an operational evaluation of the EPC concept. Although our plans are not yet firm, we expect to solicit proposals in the near future. Copies of the information Hal Bamford and I presented are enclosed. I have also asked the Meeting Coordinator to send you copies of material that was distributed at the meeting and to be sure that you are on the list for future mailings.
There has been considerable misunderstanding about the role of the EPC, particularly as related to the support of authorship. In our view, there would be distinct advantages in an journal's being able to receive manuscripts in several different forms. If this were the case, an author who has available facilities to produce a machine-readable manuscript could submit it in that form. This would save the publisher the time and expense of producing a computer record after it is submitted. Authors and their institutions have traditionally subsidized the communication process--this would be another possible way.
We certainly agree that requiring manuscripts to be submitted in machine-readable form could have an adverse effect on a journal at this time. However, since text-editing systems are already being used in many organizations, a publisher who was prepared to handle manuscripts on tape might find that the number submitted in that form was significant.
I am pleased that AGI is considering an EPC as a possible solution to its publication problems. However, we do not plan to subsidize the establishment of any specialized EPCs. In fact, one of the factors we will consider in recommending an award for the evaluation project is the diversity of the journals to be processed. Perhaps one of your interested membership organizations should consider joining the operational evaluation project as a participating publisher. This would give your entire group an opportunity for a closer look at the real benefits, and problems of the EPC approach.
Sincerely yours,
Sarah N. Rhodes
Assistant Program Director
Access Improvement Program
Letter to Mr. Millson#
Re P00737 Location: (DJOURNAL, 39583, 1:w)
Division Of Science Information
Mr. R. J. Millson
M.E.P. Limited
P. O. Box 24
Northgate Avenue

BURY ST. EDMUNDS
Suffolk IP32 6BN
Dear Mr. Millson:
Dr. Bamford has asked me to respond to your February 28 letter regarding the Editorial Processing Centers.
The Foundation has supported several projects to investigate the potential of the EPC concept, and we are currently considering the possibility of supporting an operational evaluation early next year.
The enclosed material will provide some details about these projects. I have asked that copies of several additional documents, prepared for a recent meeting held to discuss our future plans, be sent to you under separate cover.
We appreciate your interest in our program, and if I can be of any further assistance I hope you will let me know.
Sincerely yours,
Saran N. Rhodes
Assistant Program Director
Access Improvement Program
Enclosures

c77-03-28
Dr. Bamford
Program review for Dr. Burchinal and ZBB.
Dr. Montague, Southwest Research and Information Center, Albuquerque, NM
Looking for support--I gave him copies of our brochures and the EIE Program Announcement.
Mr. Wolff, GCO
Has not worked on solicitation because he expected the NSB to stop the project. Will try to get to it soon but cannot give me a schedule because of high priority work on other projects.
Ms. Healy, CAS, telecon
Asked if any action is needed on the EPC3 proposal. I suggested that budgets for the proposers' meeting and for consulting with potential contractors be developed.
We also discussed the purchase order "report" and the final report for C-656.
Sick Leave
Medical appointment; 2 hours.

c77-03-27
Sick Leave

c77-03-24
Dr. Bamford
Discussed EPC letters, check list for final reports, index concept, next steps for EPC3.
Mr. Custer
Discussions with Dr. Bamford and Dr. Savin about CSG use of Office-1

c77-03-23
Travel

c77-03-22
ACS meeting

c77-03-21
ACS meeting

c77-03-20
Travel to New Orleans

c77-03-17

Presentation to NSB Program Committee

I. Introduction

A. Journals provide the accumulated record of science.

1. They account for 63% of the $8 billion spent annually in the U.S. for STI.

2. They are essential to scientific communication now and will continue to be, but many of them are experiencing financial difficulties.

B. There are more than 4,000 scientific journals in the U.S.

1. 90% have less than 1500 pages per year (average 500)

2. circulation averages 11,000 subscriptions and ranges from 125 to 600,000 (Scientific American)

3. 79% have less than 5000 circulation; 42% less than 1000.

4. delays between the receipt of a manuscript and its publication range from 1 to 77 months (average 9.2; median 7.3)

B. Technology which could solve these problems is currently used for newspapers and magazines but is not readily available for S&T journals of low volume and complex typography. Editors and publishers are frequently not aware that the technology exists, and have little incentive to change operating procedures until a crisis occurs

C. An EPC could provide such technology to publishers for whom it might otherwise be out of reach.

II. Background

A. The memo which you have received

1. Describes the project's 3 objectives and the 3 lines of research which it brings together

2. Outlines our general approach

3. Sumarizes the schedule and costs of the project from its inception in FY 73 to its final funding in FY79.

4. Discusses the principal issues raised since plans for the project were publicly announced.

B. I am not going to recapitulate, but rather put the project in context.

III. Unusually complex project

A. Numerous and diverse participants

1. Perhaps 10 to 15 participating publishers--many of them inexperienced in the technologies to be applied

2. 1 or more sources of highly sophisticated computer and technical support

3. A contractor whose function it is to provide an EPC to serve as the communication link between the other two groups

B. Addresses the full range of editorial processing - both intellectual activities including interactions with authors and referees, and "manufacturing" activities such as keyboarding, page make-up, proofing, typesetting, through actual printing and distribution. The EPC would serve as a buffer between the users and the technology it employs to serve them.

C. Final portion of a multi-phased project

1. Past work resulting from two previous solicitations

a. design studies - developed concept, cost model
b. Prototype EPCs - Aspen, SRI: 3 journals each
2. Projected work will require the contractor to
a. assemble a group of participating publishers and organize an EPC which will support their requirements
b. analyze the technical and formatting requirements of the individual journals,
c. design, implement, and test a facility that will meet those specifications. Each journal will require less new capability than its predecessors.
d. conduct operational trials - 1 year actual production of about 20 journals
e. evaluate the results - establish scale needed for financial stability, identify a "transportable" EPC package

IV. The project has been publicized widely and the terms of the solicitation are being developed with guidance from the publishing and printing community.
A. There remain uncertainties as to the
1. Nature of the project
a. Participants and precise roles
1. e.g. Source of computer and technical support - ACS or other
b. Details of technical approach
1. e.g. specific services to be provided to each participating publisher or for each test journal
c. Business and management arrangements
1. e.g. EPC charges must be based on a pre-determined formula that provides for sharing savings or increased expenses
d. Precise costs and schedules
2. Outcomes of the project
a. Viability of EPC
1. scale needed for operational stability
b. Impact on market ecology
1. dislocations - how many journals are likely to change their composition and printing arrangements?
2. opportunities - will aggregation of small publishers open a new market for EPC services?
c. Potential for improved S&T communication
1. faster, cheaper conventional services; automatic production of indexes, specialized bibliographies, collections of related articles, etc.
2. direct use of electronic record - remote access to literature, on-line cumulative and/or multi-discipline indexes, etc.

V. Current Schedule
A. Solicitation issued in April
B. Review, including ARB, July - October
C. Project initiated in January 1978
d. Trials and evaluation completed by June 1981

c77-03-16
Ms. Healy, CAS, telecon
Indicated perferred dates for proposers' meeting: April 27-28;

May 25-26; May 18-19; May 11-12.

c77-03-15

Mr. Ashley, NTIS

Requested list of purchasers of the IPG. He will suppply printout. I should call Sue Krimm (557-4634) if there is any delay.

Dr. Burchinal

Preparation for NSB meeting.

Letter to Dr. Honkala*

Re P00739 Location: (DJOURNAL, 39359,)

Division Of Science Information
Dr. Fred S. Honkala, Executive Director
American Geological Institute
5205 Leesburg Pike
Falls Church, VA 22041

Dear Dr. Honkala:

Thank you for your recent letter about the EPC project. I am pleased that you are considering participation in the operational evaluation, and I have asked Sarah Rhodes, the Project Manager, to be sure that you have all the pertinent materials.

In response to your question, let me say that Fred is not alone in his concern about the loss of editorial control and the stifling of individual initiative. Our saying that the project we are proposing will be specifically designed to prevent any change in editorial responsibility seems to fall on deaf ears, and I really see no way to allay such fears until a demonstration is completed. In the interim, I can only repeat that we belive the EPC will offer an attractive alternative for those journals that are faced with a need to change operating procedures.

Sincerely yours,
Lee G. Burchinal
Director

c77-03-14

Dr. Ezaz, QEI, telecon

Has not yet received notification of no-cost extension. Suggested that I give my comments to Denise Behr if he is out of the office.

Letter to Dr. Honkala

Re P00739

Sent forward to Dr. Burchinal for signature.

c77-03-13

Index

Another less than satisfactory session with this file.

Letter to Scharpf re position paper P00738

< RHODES, DRAFTS.NLS;, 0840> Hal: I'd appreciate your comments.

c77-03-11

Memo and RAD for SRI no-cost extension*

Location: (DJOURNAL, 39306, 1:w)

Mr. Herbert D. Wolff, DGC
Assistant Program Director
Access Improvement Program/DSI
NSF-C75-13214; Stanford Research Institute
The subject grant is scheduled to terminate March 31, 1977.

The project has encountered several delays and the Program had planned to extend the grant period when the final funding increment was recommended. However, the Principal Investigator has recently suggested some task modifications that require technical evaluation, which cannot be completed before the scheduled termination date. Since the available funding will permit the project to continue at the current level of effort for several months, I request that the contract be extended to June 30, without additional funds, to allow time to review and process the final funding increment for this project. The RAD for this action is attached.
Sarah N. Rhodes
Attachment

c77-03-10

EPC

Discussion of hazards with Mr. Staiger and Dr. Bamford. Success of the EPC3 project would give the EPC contractor a commanding lead over the rest of the industry and could result in serious impacts on many organizations. Still no better suggestion for how we can help the smaller STI journals use computer technology, or how we can get the publishing/printing community to assume responsibility for for those journals.

Mr. Strawhorn, CSG

I called to pass on Mr. Pronko's information that his application for a travel grant was too late. He indicated that the Israel meeting would not compete with other contract tasks for priority of either time or money. He will withdraw from participation.

Ms. Meyers, CSG

Asked her to send copies of EPC meeting material to Dr. Honkala and Mr. Millson. She will also send me ten more sets.

Ms. Roderer, KRI

Reminded her that we need journal back-up numbers for the NSB meeting. She will call me on Monday.

Mr. McNinch, PRM

Confirmed that his problems with EPC3 are related to two topics:
1. He feels that we have not done our homework on the project's technical consequences as they relate to the unions and that these could have serious political impact on NSF.
2. He expects flack because the project "is wired in favor of ACS."
He will send me copies of the letters from ABP and Marine Technology.

Ms. Stoltz

Devised an approach to the compilation of reviewer statistics.

c77-03-09

Dr. Whitby, SRI, telecon

Will mail the information I requested this afternoon. Unexpended funds will last to July 1. I will request a no-cost extension noting that the final increment recommendation will be made soon.

Dr. Zuckerman, World Future Society, telecon

Inquired about the status of EPC3. Will send us a letter describing the alternate approach he wants to pursue.

Mr. Burke, Aspen

Described the EPC2 data analysis to Dr. Bamford and me. Expects to submit a draft final report in two weeks. Will develop some comparison figures for use at the NSB presentation, and deliver them next Monday.

Dr. Bamford
The QEI proposal has aged long enough. I agreed to process a final recommendation by April 15.

c77-03-08

Dr. Bamford
Mr. Staiger will be here Thursday. We will meet wth him at 4 to discuss his views on EPC3. Request for statistics.

Ms. Orr, NSB, telecon
Should the EPC item be on the open or closed NSB agenda. Checked with Dr. Bamford and Mr. Frenzen. Open.

Mr. Custer
Office-1 statistics show a continuing increase in efficiency for our slot.

Dr. Lerner, AIP, telecon
She is attending the NFAIS meeting. Called to check on what we are "doing these days." AIP has purchased a Videocomp and will be photocomposing full text soon. The APS experiment continues, but it is unlikely that UNIX will be used in production mode since it is geared for a very slow photocomposer.

Dr. Bowen, ACS
Abstract for IEEE presentation
The Editorial Processing Center - From Concept to Reality
The EPC concept is based on sharing the use of highly automated editorial, production, marketing, and business support systems by a group of publishers large enough to attain useful economies in operation. The EPC is viewed as a way to provide computer support to the publishers of many small scientific journals that are currently experiencing technical and financial difficulties.
Publishers, printers and computer centers have found it feasible and worthwhile to use the computer for virtually every function which has been contemplated for an EPC. However, no effort has been made to organize a system to support all, or even most, of those functions.
Studies directed toward generalized conclusions about the EPC, in all its organizational and economic complexities, have been supported by the National Science Foundation since 1973. Results from these projects and plans for the future will be discussed.

Bio-resume for Sarah N. Rhodes
Employed by the National Science Foundation since 1957, starting in the Chemistry Program and moving in 1959 to the Office of Science Information Service (now Division of Science Information).
Currently Assistant Program Director for the Access Improvement Program, which includes acting as Manager for the EPC projects.

c77-03-07

Ms. Krevit-Eres, telecon
Wants to be brought up to date on EPC and other AIP activities. Scheduled lunch on 03-15.

Mr. Shields, PMO
Took my picture for the IEEE meeting program.

Dr. Tate, CAS, telecon
Wants to reschedule proposers' meeting. Will hold April 27-28, and May 11-12, 18-19, and 27-28 pending clarification of the solicitation schedule.

Ms. Mellette
STIA wanted to know in 15 minutes how many requests for verbatim reviews DSI has received. I could only recall 2 in AIP, and since everyone else was out of the office that is the number we used.

Solicitation
Neither Mr. Wolff or Mr. Frenzen has looked at the draft, but they will try to get together this week and will give me their comments as soon as possible.

Dr. Bowen, ACS, telecon
IEEE has refused to honor his offer of free registration for speakers, so it will cost $75. I suggested that if AIP couldn't afford it I would be glad to withdraw, but that didn't work.

Library
No information about ONLINE or On-Line Review, or the new Elsevier journal.

Dr. Bamford
Confirmed our Wednesday morning appointments. Hal, Bill Burke has a conflict in the morning so I rescheduled for 1:30.

c77-03-06

Catch-up Day
Vouchers, Projectevents, progress reports.

c77-03-03

Drs. Maveret and Robert Singleton, U. Mass.
Delivered a draft of their proposal for a "Centralized Information System." I gave them copies of the Guidelines and suggested that they find out about NASIC via Alan Ferguson at NEBHI in line with Dr. Weiss's comments. They were not familiar wth the Medlars system and had not heard of the SDC and Lockheed services. They did indicate that they realize that converting old information to computer-readable form is too expensive, so they propose just to start now and build new files!

Ms. Healy, CAS, telecon
She called to confirm that the paperwork reduction numbers are still valid. Will send me a copy of the background data.

Ms. Meyers, CSG
Asked her to send Xerox copies of the slide material to Ms. Selle. I will follow up. Also requested more copies of the handout package since we have none. She told me that the three IPG workshops will all be in Washington.

Ms. Selle, Dartmouth Printing Company
I called to discuss her request for slides used at the Dec. 8 EPC3 meeting. She is particularly interested in the STI schematic that King used.

c77-03-02

Mr. Strawhorn, CSG, telecon
He is planning three meetings: Photocomposition - April 20 or 21; Word Processing - April 13 or 14; and User Advisory Group

- April 6 or 7. There will be more information in the next progress report, but he wanted to invite us now to allow us time to plan. The word processing group is generally based in New York, so that meeting may be there. The others will be in Washington.
He has not yet applied for an international travel grant for the meeting in Israel. I told him he may be too late, and that even if there is travel money in the contract it would take special approval to make it available for that trip.
He also asked what our plans are for the next step. I told him Bill would be in touch as soon as he feels ready to take over the project management.

c77-03-01

Mr. Shirley, BMI, telecon
Checking to be sure the draft final report had been received. Asked for a copy of the EIE announcement.

Dr. O'Connor, Lehigh
I called to verify the schedule for his passage retrieval proposal. He plans to submit it formally in September, requesting a September 1978 start date. This is a full year later than we had discussed previously, but he has a HEW project that requires additional time.

Mr. Burke, Aspen
I called to ask about EPC numbers. He indicated that the final report is in typing. Suggested that he come in to talk wth us about the analysis since both time and dollar figures are difficult to evaluate because baseline information is not available. Hal, I have scheduled an hour at 10 am on Wednesday 03-09.

Ms. Singleton, U. of Mass., telecon
She has a proposal for a "centralized information system" and is looking for funding. I tried to get her to mail us a copy but she insists on bringing it in on Thursday.

Dr. Bamford
Reported on his meeting wth Atkinson. Alerted Dr. Cima and me to problems that may come up while he is on leave.

WS2:

c77-03-31

Cook,Truman (SRI)
Spoke to him about San Antonio SRI meeting. Ollie Henslie will call me and make final arrangements for a talk on EIE etc. We may expand program but this has to be worked out.

Donlen, Dr. Roger (NLM)
Received proposal for review. He wanted people in the area of EIE for a visit to Georgia Tech. Gave him the names of M. Turoff, T. Featheringham(NJIT) and I. Mitroff(Pit.).

EIE
Received first proposal from L. Freeman of Lenigh U.
Turoff sent mess. by EIE on new cities to be added to TELENET.

Wolff, H.
Spoke to him on sole source memo for Krall proposal. I will have to change but only the intro.

Burchinal
Program review.

c77-03-30

CSG

Meeting with J. Strawhorn on conversion to NLS. Went well. HEB will meet with J. Norton to get some info. on tech. problems but these answers will be the last step needed to negotiate a contract between CSG & SRI. HEB will try and get proposal from SRI to CSG leaving the start up date out.

Abramson, Norman
From the University of Hawii.
Meeting with LC on EIE project and radio transmission of digital data.

Dohler, Roger
From NLM. Spoke with HEB about EIE and proposal from Slamecka, Vladimir(Georgia Tech) which I will review to see if it fits into our announcements area. Will suggest member of panel that will make site visit to GA Tech.

c77-03-29

Burchinal
Program review.

Krall
Working on package. Wrote memo to H. Wolff giving details so he can write a sole source justification.

Brownstein, C.
In RA. They are doing computer conferencing study to see if productivity using system can be measured. Work being done by Jacques Vallee and Robert Johansen of group 72.
Showed him EIE system and asked him to suggest EIE review panel members. We will keep each other informed on how projects are going and he will try and refer projects on EIE to us.

Memo to STIA/ARB*
Location: < DJOURNAL, 39581.NLS;1, >
James L. Vitol
Executive Secretary, ARB
Program Director, AIP
Program Associate, AIP
Information for the Review of the Innovation Survey project
Enclosed is the information requested for the STIA/ARB review of the program plan for "Continuation of Innovation Survey". Cost estimates for the 24 months of operation of the project total $355,469 (refer to the Table of Contents, DSI-74-24410-A02 through DSI-74-24410-A09). Using this as the basis of calculation and assuming a constant rate of expenditure, a 12 month extension of the CSG contract would cost about $180,000. A more realistic calculation, allowing for a 6% rate of growth for expenses due to inflation, estimates the 12 month extension to be about $200,000.
William Savin

c77-03-26

IPG
Review and rewrite of memo to Vitol. Package is finished, will go via HEB to STIA/ARB on 3/28.

EIE
Review of Conference 72. R. Hiltz has informed us that a final report is about to be started. On 3/1 an on-line conference will be held but I will not be in the office. Is anyone going to join the conference on that day?

Krall
Review of material in Program Officers Handbook. Starting to

put final package together.

EIE PANEL

List of areas to included on review panel plus some possible members sent to AIP staff by Journal Mail. Please comment as soon as possible.

c77-03-25

IPG

Put together full package for STIA/ARB. It has been reviewed by LC and sent to HEB for comment. J. Vitol would like package by 3/28. Review by ARB has been scheduled for next meeting.

LC noted that budget for the 12 month extension seems high but this was calculated from the present rate of spending.

Burchinal

Review of his article. Made comments but seemed ok.

Gautreau

Call about book.

STIA Office

Have a key to 1225 so we can use Xerox machine on Sat. & Sun. It will be in the top center draw of my desk.

c77-03-24

HEB & LC

Discussed letter from Applied Communications Research(Mick,C.) re: chron 3/23. Conclusion was that a program (EIE) evaluation might be the way to go. We will meet again next week to discuss this matter.

It might be a good idea also to get more than one proposal in the area and this will be looked at.

HEB

Discussed Krall proposal and letter from the British Library. I will work on Krall recommendation as soon as possible. BL seems to be doing work along the lines of IPG(CSG). HEB will answer letter from M. O'Hare and we will try and foster link between CSG and Jack Meadows of The Primary Comm. Research Center(UK), the researcher doing the BL study to generate the IPG for the UK.

Paris, Alan(ISR)

re:p00537 Talk on EIE project.

CSG

Lunch meeting with HEB, SNR and P. Custer. Spoke of topics HEB will talk to J. Norton about when in Calf.

Will visit CSG on 3/30 with HEB and P. Custer.

IPG

Worked with SNR on files for STIA/ARB. Vitol says to form a summary package giving awards, reviews and recommendations.

Started work on Vitol package for ARB.

c77-03-23

IPG

IPG plan will go to STIA/ARB for action. Will put files in order for ARB review. Will ask Vitol how far back records must go. LC thinks they may only need the last action for review but I think they will want full record of project. Will send to ARB via HEB.

Program Managers Course

Sent vita.

Memorandum to Dr. Averch+

re DSI-74-24410

Location: < DJOURNAL, 39456.NLS;1, >
Harvey Averch
Acting Assistant Director, STIA
Director, Division of Science Information
Program Director
Access Improvement Program
Continuation of Innovation Survey
DSI-74-24410
The purpose of this memorandum is to set forth for your approval a plan for continuation of this Program's Survey of Innovation in Scientific and Technical Communication. In this project the contractor employs a variety of techniques to collect and evaluate information concerning innovative solutions to problems of scientific and technical communication. The resulting files on the state-of-the-art and on individuals active in the field are invaluable to the Program as a basis for planning. Guidebooks based on these files are distributed to potential innovators, who are thus linked both to the sources of innovation and to the program office.
BACKGROUND
Work on this project was first funded in June, 1974, when parallel contracts were awarded to Capital Systems Group, Inc. (CSG) and to Applied Communication Research, Inc. for the independent development of prototype planning guides and implementation plans. When the prototypes were completed in April, 1975 the Foundation convened a panel of expert reviewers to evaluate and compare the results of the two efforts. This panel judged CSG's product to be more likely to satisfy the Foundation's purposes in supporting the project. Thus, CSG has undergone competitive review at two critical points in the project's history: selection for the initial developmental phase, and a run-off competition with the other developmental contractor.
In the autumn of 1975, under an amendment to its original contract, CSG produced and began to distribute 2,000 copies of its planning guide, entitled "Improving the Dissemination of Scientific and Technical Information: A Practitioner's Guide to Innovation". This planning guide provides publishers, editors, and other potential innovators with practical guidance on possible innovation in (1) the capture, (2) the dissemination and (3) the delivery of STI.
To date, copies of the Guide have been placed in the hands of over 1,200 key individuals, selected on the basis of their ability to introduce changes into the processes and channels of scientific communication. The Guide has been distributed not only to all of the world's major English-speaking countries, but to a number of other countries as well. Several requests have been received to translate the Guide into other languages. In all, copies have been placed with key individuals involved in the science-information programs of 15 foreign countries. Reaction to the project has been both extensive and positive. The Guide has been cited and favorably reviewed in the professional literature, and both CSG and NSF have received laudatory correspondence from well-known figures in

the world of scientific communication. In 1975, the Guide received an award in the annual competition of the National Association of Government Communicators. By the critical measure of user reaction, then, the project has been extremely successful.

Underlying the Guide are the files and computerized data bases which CSG maintains on a continuing basis. These resources are used not only as the basis of the published Guide but also in the advisory, referral, outreach, and other clearinghouse services which CSG provides to the Foundation and to readers of the Guide.

Originally, the project's scope was intentionally restricted to innovations related to the primary dissemination of information (i.e., the creation and distribution of the first formal record of science). This restriction was based on the idea of using primary dissemination as a test case, and on the belief (shared by CSG and NSF) that to attempt to address simultaneously so broad a topic as innovation in all aspects of scientific communication would necessarily result in a serious diffusion of effort, degrading the quality of coverage of any one aspect of that system.

From the outset, however, CSG and NSF have agreed that the project should, ideally, branch out to cover additional aspects of scientific communication. The phasing of this process, of course, depended on response to the Guide and on the rapidity with which control could be established over the components of the basic project. CSG is obligated by the terms of its present contract to provide detailed plans for this expansion. In general terms the areas to be added to the project are:

* innovations related to information reprocessing, retrieval and enhancement. The areas of scientific communications to be studied relate to the services provided by secondary distributors (e.g., the producers of abstracts and indexes, publishers of bibliographies and producers of machine readable text).
* innovations related to accessing (identifying and acquiring) STI considered from the viewpoint of the potential individual user and the user's agent. Examples of areas to be surveyed are literature retrieval systems, intermediary services and library automation and development.

PLAN

The project is funded through 30 June 1977. It is planned to continue the project in two phases:

* A sole source extension of the existing contract through 30 June 1978. The sole source extension is necessary to continue this project in an uninterrupted fashion while a contractor is found for a three-year follow-on study.
* Competitive award of a three-year follow-on contract on 28 February 1978. If this award is made to CSG then it will supplement the contract that firm is working on through 30 June 1978. If a new contractor is selected its contract will overlap with CSG's during its first four months of operation. A new contractor will be required to take over and update the files maintained by CSG, serve as a resource

to DSI on the state-of-the-art in scientific and technical communications, update and distribute the Guide and expand the project as described above. To do all these tasks while training a new staff will require an overlap with CSG to insure a smooth and orderly transition of the project.

This plan involves the following detailed schedule of events:

* 31 March 1977: Submission by CSG of a plan for the continuation of its work at the present level through 30 June 1978. During this period CSG will continue to update its files and distribute the guidebook, serve as a clearinghouse, and hold workshops in areas related to this project.
* 30 June 1977: Submission by CSG of its report detailing the plans for the expansion of the project.
* 30 June 1977: Award of a continuation contract to CSG.
* 1 August 1977: Issuance of RFP by NSF for a three-year extension of the expanded Innovation Survey.
* 15 September 1977: Receipt of proposals.
* 15 November 1977: Proposal evaluation completed.
* 15 December 1977: Negotiations completed with proposers in the competitive range.
* 30 December 1977: Best and final offers submitted by proposers in the competitive range.
* 15 January 1978: Selection of contractor to carry on the project.
* 28 February 1978: Award of the new contract. Three successive 12 month awards will be made to fund the expanded project.
* 30 June 1978: Termination of the CSG continuation contract.
* 28 February 1979: First continuation award. A program review will be held before this award is approved.
* 28 February 1980: Second continuation award. A program review will be held before this award is approved.

Should it seem desirable to continue the project beyond the three-year period contemplated at this time, the Program would expect to follow a procedure similar to the one outlined here, with the added possibility that the distribution of products based on the Survey files might be spun off and continued as a commercial venture.

RECOMMENDATION

This plan has been discussed with Mr. Vitol and with Mr. Wolff of the Division of Grants and Contracts.

Your approval is recommended.

Harold E. Bamford

Letter to Mr. Thomas R. Buckman*
p00535
Location: < DJOURNAL, 39441.NLS;1, >

Division Of Science Information
Mr. Thomas R. Buckman
The Foundation Center
888 Seventh Avenue
New York, NY 10019

Dear Mr. Buckman:

Enclosed is the program announcement you requested on "Operational Trials of Electronic Information Exchange for

Small Research Communities".
In your letter you described several possible projects which I believe could fall within the guidelines detailed in the announcement. If you have any questions concerning the development of a proposal I would suggest that you speak with Dr. William Savin (202-632-5800), the DSI staff member who will be handling these projects.
If we can be of any further assistance to you please do not hesitate to contact us. Thank you for your interest in our program.
Sincerely yours,
Lee G. Burchinal
Director
Enclosure

Declination letter on Battelle*
Location: < DJOURNAL, 39440.NLS;1, >
Division Of Science Information
Mr. Frank Lukz
Contracting Officer
Battelle Memorial Institute
Columbus, OH 43201
Dear Mr. Lukz:
We regret to inform you that the National Science Foundation is unable to support you proposal entitled "Options for Improving the Compilation, Dissemination, and Use of Directories of Scientific and Technical Information".
In evaluating each proposal submitted to the Foundation, a number of factors are considered. They include the following: the scientific merit of the proposal and its merit in relation to other proposals received by the Foundation in the same general field of investigation; the distribution among fields of investigation within the program of the Foundation; the geographical distribution of support by the Foundation; and, finally, the funds available for the support of projects. Thus, many excellent proposals cannot be supported for reasons aside from intrinsic merit, although this is an important consideration.
Even though we are unable to support this proposal, we would be pleased to consider other proposals which you might wish to submit.
Sincerely,
Lee G. Burchinal
Director
cc: Robert Kohn

Letter to R. L. Snyder*
Location: < DJOURNAL, 39431.NLS;1, >
Division Of Science Information
Mr. Richard L. Snyder
Roche Institute of
Molecular Biology
Nutley, NJ 07110
Dear Mr. Snyder:
As per our discussion of March 16, 1977, I am enclosing some of my ideas on scientific communications and the electronic media. If the program committee for the next SRA meeting in San

Antonio finds these ideas interesting, I will be glad to speak with them concerning the full development of these topics into a program. I believe scientific communications is a relevant area for the society and the members will find it interesting and stimulating.
Topics which might be included in a general session on scientific communications and the electronic media are:

1. A review of NSF research in the area of scientific communication
2. Computer conferencing and electronic information exchange
3. Word processing
4. Alternatives to conventional publishing
5. The future of computer base information systems

These are a few general areas which could be developed by people doing communications research into what I think would be an interesting session. Though the topics are general and probably would have to be made more specific by the speakers chosen, I think they give the general flavor of the types of areas which might be discussed.
As requested, I have enclosed my resume which is six months old and I have had to correct by hand. I would be glad to speak to you further concerning this matter.
Sincerely yours,
William Savin
Program Associate
Access Improvement Program

NLS

J. Beck has tried to fix the SPELL PROGRAM. I have a new version of OSPELL in file ABC. Try it you may like it. <.d:w1>

4-MAR-77 1436-PST BECK: BAD File SPWK.nls;58
Distribution: SAVIN, lieberman, beck
Received at: 4-MAR-77 14:36:47-PST
OK, bad file fixed. New good version is spwk.nls;60
....jeanne

15-MAR-77 1038-PST SAVIN: SPELLINNG CORRECTION PROGRAM
Distribution: BECK, LIEBERMAN, savin
Received at: 15-MAR-77 10:38:07-PST
I have used the program again today and find again that the file created is BAD. Can you give me any help.
The bad file is Savin, SPWK.

15-MAR-77 1740-PST SAVIN: SPELLING CORRECTION PROGRAM
Distribution: BECK, LIEBERMAN, savin
Received at: 15-MAR-77 17:40:02-PST
Tried the program again and it seemed to work. Do not understand.
Can you tell me if anyone else is having problem with the program?

17-MAR-77 0940-PST BECK at OFFICE-1: Spell problems
Distribution: SAVIN, LIEBERMAN, BECK, FEEDBACK
Received at: 17-MAR-77 09:40:23-PST
Message-ID: <[OFFICE-1]17-MAR-77 09:40:16-PST.BECK>
Well, the problems you're having with Spell don't seem to be happening
to others right now. I want to get a little more information about the

procedure you use.
Which branch do you Process?
Do you do this in TNLS, Display NLS, or do you start out in DNLS and
then Simulate TNLS?
Does there seem to you to be any common characteristics about the times
when Spell fails for you?
What we might do is have you run Spell some time while you are linked to
someone here to see if we can catch something.
The next time Spell fails, just check to see if Vannouhuys, Beck,
Lieberman, Feedback are online at the time and link to one of them to
show them what state things are in. You could also telephone Rob or me.
We should try to catch it in the act.

18-MAR-77 0539-PST SAVIN: SPELL
Distribution: BECK, savin
Received at: 18-MAR-77 05:39:58-PST
I run spell program in TNLS because I have had problem getting a final output file at times. I have run program twice since I mess. you and it was ok so it could have been me that is the problem.
If you want to check PB I run it is savin,abc,ospell.
Thanks.

18-MAR-77 0721-PST SAVIN: SPELL
Distribution: BECK, savin
Received at: 18-MAR-77 07:21:59-PST
Just ran spell program again and it seemed to work but I had two error and one system reset needed. I was in DNLS.Again this could have been net etc. and not program problem.

19-MAR-77 0631-PST SAVIN: SPELL PROGRAM
Distribution: BECK, savin
Received at: 19-MAR-77 06:31:36-PST
I ran program again today and it told me I had an Illegal Inst. and left me in TENEX. I was in DNLS.
I have no question now that this program is not working for me. If you can get me next week I'll run it for you.
PS. Trouble always starts after checking and while making new file.

19-MAR-77 0835-PST SAVIN: SPELL INFO
Distribution: BECK, savin
Received at: 19-MAR-77 08:35:16-PST
I can give you some more info on spell program.
1. If no corrections are made I have the problem.
2. When it gets back into PB and does an Update Plex-and says it is not needed that is where it seems to hang up.
3. Message is Illeg TENEX source/destination designator.
Sorry to keep doing this but I use this program often and would like to have it back.

21-MAR-77 1105-PST BECK at OFFICE-1: Change OSPELL
Distribution: SAVIN, LIEBERMAN, BECK

Received at: 21-MAR-77 11:05:48-PST
Message-ID: <[OFFICE-1]21-MAR-77 11:05:43-PST.BECK>
Okay, so the update hangs it up when there's been no changes made. In
fact, the version of the process branch that Dirk runs successfully
every day executes the update file step BEFORE running SPELL (although
he says he's never had no spelling changes needed!).
Thus, I have changed the order of the commands in the process branch at
<USERGUIDES, SPELLING-CHECKER-GUIDE, ospell> to be identical with
Dirk's. You can either re-copy <SAVIN, ABC, ospell> from that new
version, or just move the "upd fil" step to follow the "jum ite" step in
your copy (from fourth to second step).
Now, this change should THEORETICALLY NOT change what it does, but I
think it may circumvent the hangup we don't fully understand. Why don't
you try the modified PB on some file that doesn't need any spelling
changes, and let me know if it's more successful.
Thank you for your patience with the SPELL problems.

MITRE tip down most of the morning but I am able to use the NBS tip in tnls.

Mick, Colin K.

Re: p00751. Applied Communication Research
Proposes to develop a common evaluation methodology for all teleconferencing experiments, establish a central teleconferencing evaluuation clearinghouse and provide update reports.
I think this study is not needed now. If we see that the projects are not able to assess themselves we can seek a contractor to help with assessment.

c77-03-22

Wolff, H.

Informed me he and Mike Kenefick approve of IPG plan.

Burchinal

Meeting of DSI staff to prep us for meeting with Dr. Harvey Averch, the new Acting Assistant Director for STIA.

HEB2

Meeting with LC to review paper written by Averch and plan AIP presentation for pm meeting with Averch.

Averch

Meeting with DSI staff at which each Program talked of the research it is supporting. I spoke for about 2min. on EIE.

Miller, Ruth

From Portland State. She thinks they may have a proposal on TA by the end of the month. If they do not have support into in time I told her to contact me.

Chron

Please update your chron files before you logout.
Had problem printing Chron files today because the system was

down when I could get on it.

c77-03-19

EIE

Worked on Review Panel.

Strawhorn

John and I spoke of the problems he sees with the conversion to Office-1 for IPG study. The following are some facts he gave me and some questions which still need to be answered.

Data tapes of Word-1 files(examples not full files) have been sent to J. Norton. These had RAND files and Human Resources file as examples. I told him to send other IPG files including the Guide so output to print could be looked at. These files will be to Norton before HEB gets to SRI> John still needs to know about the type of type composer service Office-1 will provide for CSG. They need to know about how long output for printing will take to get to them, if scientific characters are available and if the can get single page make-ups?

CSG needs to know what is involved in the file conversion and how much of the system they will need for their work. The tax problem raised by RAND(Jack Talmadge) needs an answer. The fact that SRI charges a fee and pays no taxes has them worried. CSG can have a problem I am told if they do business with SRI and SRI is found to have a tax problem. This question needs to be answered by a member of the SRI legal staff and I think when HEB visits Norton they should meet with the person who can draft a replt to this question for CSG.

SRI needs to act to answer these question for CSG in the near future. HEB should make this point with them if we hope to get CSG on the system.

Burchinal

Draft of letter to Thomas Buckman. AS will output and send to Burchinal via HEB.

EIE

I am not noting who we are sending Announcements to but a list is in <STOLTZ, EIE/ADDRESSES.NLS;,>.

c77-03-18

Kohn

LC reviewed Battelle rejection and had me redraft letter(sent to the wrong man), add PIP and put in flags.

Revised package sent to Burchinal.

S. Ogleby(GW)

Meeting on EIE.

STIA

Meeting at which Dr. Atkinson announced Dr. Harvey Averch will assume, effective immediately, the position of Acting Assistant Director for STIA. Dr. Averch will continue as Assistant Director for Science Education..

Dr. Atkinson asked that the meeting be very open but nobody seemed to have anything to say or ask. I did not understand why.

IPG

Final version signed by LC and sent to Burchinal.

H. Wolff was out and did not review.

c77-03-17

Letter to Connolly*
Location: < DJOURNAL, 39407.NLS;1, >
Division Of Science Information
Mr. George C. Connolly, Jr.
Office of Special Programs Development
New London Laboratory
Naval Underwater Systems Center
New London, Connecticut 06320
Dear Mr. Connolly:
At this time, no further information is available from the National Science Foundation regarding the Program Announcement, "Operational Trials of Electronic Information Exchange for Small Research Communities", but as stated in the document we would be glad to answer any specific questions you might have concerning the development of a proposal. The announcement will be applicable for at least two years and there is no closing date for proposals. This is the first call for proposals and, therefore, there are no reports of earlier phases of the program. I would like to call your attention though to the reference on page 10 of the announcement which do provide an extensive background on Electronic Information Exchange.
Thank you for your interest in our Program and please do not hesitate to contact us with any specific questions you might have.
Sincerely yours,
William Savin
Program Associate
Access Improvement Program

IPG
Memo to Granger changed by HEB and now in final form. Given to AS to output.
No comments from H. Wolff(DGC), was not in.

EIE
Went over criteria for selection of Review Panel for EIE Trial Project Proposals.

Travel
Spoke to NJIT about payment for travel. I may go broke before this is worked out.

Kohn
Finished paper work for the rejection of the Battelle proposal "Options for Imptoving the Compilation, Dissemination, and Use of Directories of STI".
Excerpts from reviewers' comments
IMPACT
Basically, the proposal is too vague regarding the expected outcome of the effort. The object of the research program as stated on page 3 says "...to provide guidance for more effective use and compilation of future directories ...". In the section on anticipated results on page 7, the proposal states that "The proposed research program is expected to produce several results that will be of value to ...". However, the only specific example cited is that of preparing "good" and "weak" directories. Recommendations are also alluded to but not specified in terms of real value. No solid rationale is stated for doing the study nor

benefits cited as an outcome of the study.
The proposal does not present enough substance to permit meaningful evaluation. Directories of STI are clearly an important tool for STI dissemination and a study of such directories is warranted. A carefully implemented study in this area could lead to meaningful recommendations for directory improvement or as a minimum provide some evidence of directory utilization and value. Whether these results will come from the Battelle proposal is not clear.
It seems to this reviewer that the study proposed has some value and importance based on the fact that information sources seem to be continually expanding and directories which identifies sources and the nature and availability of the information they purvey can be quite useful. On the other hand, however, it is unclear to this reviewer how the preparation of directories related to science information and an analysis of reaction from a wide range of user classes will contribute materially towards determining options for future directory publications and/or provide information on the value of preparation other than by conventional hard copy.
METHODOLOGY
The proposal states that the investigators will query a number of classes of users, but it is not clear from this write up whether they are concerned with the question of why the directories are prepared by these various groups or only with response of these groups to directories prepared by various groups. The population to be surveyed seems to be a mixture of preparers and users. If it is only the latter, then it seems to me that the questions and approaches which have been prepared for each group are quite different and probably rightfully so, but I fail to see how a uniform set of questions will be obtained.
This proposal is poorly written and tells little about the methodology of the study. The end product for determination is not spelled out sufficiently to justify doing the work. The proposal does not indicate the number of people in each category who will be questioned or interviewed. Nor does the proposal give any information of the type of questions that will be asked. Further, it is not entirely clear from the proposal how the subjects will be selected.
Interviewing producers and compilers of directories to learn the value of the directories produced is nearly useless.
The technical approach seems weak. The survey is to be conducted in three segments of interest in seven types of organizations. Anticipated results are given, with no indication of the analysis to be made of the data collected. While the research plan proposes a typical survey approach, it does not adequately show full consideration of basic survey methodology; i.e., probability or non-probability sampling, definition of the universe being studied, definition of the variable being studied, sample design.
JUSTIFICATION
This proposal, regardless of whether or not it is consistent with AIP, has failed to thoroughly justify the need for such a study.

Both the research plan and its anticipated results seem somewhat vague. Certainly it did not list sufficient evidence that will warrant the expenditure of $50,000.

c77-03-16

IPG

Memo to HEB. H. Wolff did not get me his comments but I will try again on 3/17.

EIE

Chose experties I think are needed for EIE review panel. Will review with HEB.
Spoke to Turoff about panel and he thinks areas are ok and will send names of experts he thinks may help review proposals.
Murray says we will have about 10 proposals by 4/1.
Recieved my second phone call from a man who had not received the announcement even though his name is on the mailing list(so announcement was sent). Mail service seems to be very bad.

Kohn

Review of material for Baattelle proposal rejection.

Snyder

Member of SRI and wants details of possible session for meeting in Oct. Will try and write this week.

Stoltz

Used the Qualterm tape unit for the first time to do a group of form letters. Worked well and did not have to use NLS after the letter was outputed to tape. Anita thinks she has some ideas to experiment with which may improve system but all systems are go for now.
PS. It is easy to use the tape unit.

c77-03-15

Letter to Mr. James Rockford*

< DJOURNAL, 39347.NLS;1, >

Division Of Science Information
Mr. James Rockford
Superintendent of Police
Chicago Police Department
1121 South State Street
Chicago, IL 60605
Dear Mr. Rockford:
While attending a meeting of the American Physical Society held at the Palmer House Hotel in Chicago, Illinois, a Mr. Morris Simms the operator of a limousine service, misrepresented himself as cab driver and took a group from the APS meeting to North Lincoln Avenue and overcharged us $10 for the ride. Through the Palmer House Security Office, we lodged a complaint about Mr. Simms' action. This matter was turned over to Officer Thomas Carroll (Star #9048) who contacted Mr. Simms and was able to obtain a $10 refund for said ride.
I wish to thank the Chicago Police and in particular Officer Carroll for his help in this matter. As a visitor to Chicago, I am impressed with the service rendered by its fine police department. I must admit I was not originally hopeful that this matter would receive the attention needed to bring it to a satisfactory conclusion. But I see that men such as Officer Carroll and the other members of your fine department do see a need to keep a major convention city like Chicago free of the types of problems Mr. Simms could cause.

Thank you again for your assistance in this matter.
Sincerely yours,
William Savin
Program Associate
Access Improvement Program

Letter to Porter Parris#
< DJOURNAL, 39346.NLS;1, >
Division Of Science Information
Mr. Porter Parris
General Manager
Palmer House Hotel
17 East Monroe St.
Chicago, IL 60690
Dear Mr. Parris:
I am writing to express my deep appreciation for the service extended by two of your security officers, Mr. Robert Fehrman and Mr. John Bogue. During my recent trip to the general meeting of the American Physical Society held at the Palmer House Hotel, a Mr. Morris Simms representing himself as a cab driver took four other convention attendees me and to North Lincoln Avenue and charged us $15 for what would normally be a $5 cab ride. Mr. Simms informed us that he was not operating a cab but rather was representing a limousine service. Upon my return to the Palmer House, I notified Security Officer Robert Fehrman of what had transpired. He and Mr. John Bogue, with the help of the Chicago police, were able to obtain a $10 refund from Mr. Simms.
The services provided by the Palmer House Security Office I feel were extraordinary. I have always enjoyed my stays at the Palmer House and this experience only helps to reinforce my feelings that your hotel is one of the finest establishments I have had the pleasure to frequent.
Thank you again for helping me with this matter.
Most sincerely,
William Savin
Program Associate
Access Improvement Program

Burchinal
Xerox of info for chapter.

c77-03-14

IPG
Worked on draft HEB gave me on 3/12.

c77-03-13

Burchinal
Reviewed the information CSG provided for his chapter. Will Xerox part of the information provided and I hope this will end this project for me.

c77-03-12

Kohn
Completed the paper work on the rejection of the Batell Lab. proposal. Given on tape to AS.

HEB
went over the latest version of IPG continuation plan. He didn't like it and will redraft. I will work on it at home so we can have a version early next week. I can not follow the dates for the project and will have to H. Wolff(DGC) to see if

contracts will give me the info needed. SNR- Can you see me on 3/14 on this?

NIH

went to final report made by NJIT group to Commission on Biomedical Research and Tech. I had worked on this project for almost 14 months and wanted to see the final output. ZMeeting lasted untill 5pm and the Comm. is still interested in having more discussion on the project. I will get copy of the final report if anyone is interested.

c77-03-11

IPG

Copy give to Wolff(DGC) and HEB. Memo to Granger on tape but not input as AS had problems with Custer travel request and had to work on that.

EIE

Announcements seem to have been found. New box in my office.

Projectevents

Updated the file as per notes from HEB.

Strawhorn

Received information for Burchinal book chapter. Will review and reproduce what I think will be of value in writting chapter.
Talked of EIE and he said that the terminal they are using they are having problems getting into system with (may be TELENET) and I told him I would inform Turoff and would try and look at terminal when I return the material he gave me. Note that D. King uses the same terminal and has the same problem.

Burchinal

Reviewed info I gave him for his chapter and asked for full articles in two areas I had just given him highlights. Also gave him an article by King Research titled "Some Preliminary Comments Concerning STI". I have a copy if anyone wants to see it.

Connoly

Draft of letter on EIE questions.

c77-03-10

ASIDIC

will not be going to meeting in Atlanta, GA (March 13-15).

IPG

New draft of plans to be sent to STIA.
Can be found in <SAVIN, IPG4.NLS;,:w1>
Covering memo to Granger also being drafted. Will speak with Wolff(DGC) to show him what we are going to send to STIA.
Had to input at home.

Kohn

Started the paper work to reject the Battelle proposal "Options for Improving the Compilation, Dissemination, and Use of Directories of STI".
Spoke with LC and got model to follow. I also have the Program Officers Handbook and will use this as a reference.

Krall

Gave copy of revisions to HEB for comment.

c77-03-09

NFAIS

Morning plus lunch.
Gave talk on EIE. Went well. Meet H. W. Koch of AIP who

thinks we can put a notice in PHYSICS TODAY on EIE Trial Projects. People seemed interested in system but may not have seen the possibilities for A&I. Spoke with William Baker (Bell Labs) about UNIX. We should find out about this it is a very good system for word proc.

EIE Announcement

Stock seems to have lost 2500 copies of the announcement. I got 30 copies from CP who now have about 550. Stock and Mail Room (who had all copies to start with) are all looking.

IPG

Worked on new draft.

Custer

Will be using the ASPEN terminal. Needs the wide paper feature.

c77-03-08

Science Information Activities Task Force

Went to the morning meeting and found it interesting.

IPG

Went over HEB comments and started to re-draft the section detailing the future plans.

NFAIS

Worked on talk to be given on 3/9. This is the final version!

HZ 2000

Terminal now has upper and lower case letters and line printer.

c77-03-05

NLS

Had problems with SPELLING PROGRAM in that it gets into a loop and will not exit. Informed J. Beck because Rob was not in. Will keep you all informed.

NFAIS

Worked on talk to be given on 3/9. Hal- will you talk to me on 3/8.

EIE

Worked on trying to understand CON. 72. Printed out the last 40 messages and tryed to see what information is in this group of 110 comments. I do not yet know what most of the people are talking about but they sure like to type!! If anyone wants to see the output of an active computer con. it will be in my office.

c77-03-04

EIE

Ordered another box of the announcements from stock (Richard Wheeler).

Turoff sent me EIE message that he has checked on proposals and thinks thatwe will get about 10 by the end of the month but we will have a much larger group by the end of April. He did not give me anyone to speak to and the group we mailed to is 150 names long. Will speak to him again next week.

Sorted mailing list for EIE by making a filter that looked at last name on first of address. Can be seen as a PB in <savin, abc.nls;,psort>.

Cima

Information for Turoff

3-MAR-77 1636-PST SAVIN: TIP NUMBERS IN NEWARK

Distribution: CIMA, savin

The tip numbers in newark are: 201/932-2750 &

201/821-8085.

Custer
Will get info for Bill Dennis on Office-1.<.d:w1>
2-MAR-77 1250-PST SAVIN: Information on Office Automation
Distribution: LIEBERMAN, savin
Bill Dennis of NSF is doing an article on OFFICE AUTOMATION and would like as many references as you or the other SRI might be able to provide.
I think this might be a good place to show the NSF what this area has to offer. If you have any questions please contact me.
THANKS

J. Ennis
Down from NJIT to visit at NSF. Had lunch.

c77-03-03

Custer
Info for Turoff- Paul thinks EIE-Office 1 interface should be in TENEX and I think he is right. LC will send TENEX Guide, tip numbers, etc. to Murray on Friday.

CSG
New version of future plans <SAVIN,IPG2.NLS;,> to be typed by AS. Also updated PROJECTEVENTS.
Spoke to Strawhorn about project and possible info for Burchinal.

Burchinal
Review of ideas for his chapter on electronic pub. Showed him what I had done and told him I would speak with D. King.

Power Shut Off
No power on Sat. in office so will work at home. Will be able to use NLS and fix final version of my talk for 3/9.

c77-03-02

Burchinal
Went to other Divisions to speak of EIE and to see if he could speak to them on how they might get NSF research projects to use system. It seems that he was well reveived and will speak to many of the program directors at Division meetings.

ANS
Letters to be put into drafts.
Helped her with filters and looking for PC's draft of SRI package in CJOURNAL.

IPG
Rewrite and review by SNR. Will try another draft.

EIE
Message to Turoff on who are best bets to get us a proposal this month.
Sent 2 more announcements and gave Burchinal about 30. LB seems to be sending out quite a few of the announcements.

ASIDIC
Made res. for meeting.

c77-03-01

Program Managers Course
Will go to first session April 18-22.

EIE
HEB2 informed me that we will need EIE Trial Project proposals by the end of March if we are to fund them this FY. Will try and speak to groups we know are going to submit proposals.

Herb Wolff
Spoke to him on CSG extension. They signed last week. I told him we will submit a plan to DGC for comment which will detail how this project will be continued over the next 8 years.

NJIT
Sent them my expenses for AAAS Denver trip.

EIE Announcement
Checked with Mail Room and found that it was mailed 10 days ago. Allentuch at NJIT has received his copy.

Mail
Went through a weeks mail.

through a weeks mail.

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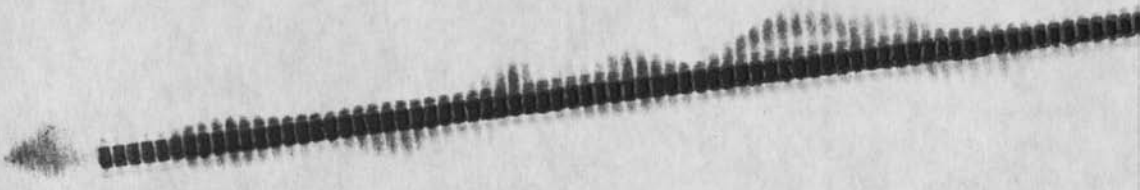

< GJOURNAL, 40616.NLS.1, >, 6-Jun-77 01:13 XXX ;;;; .HJOURNAL="RA3Y 3-JUN-77 16:21 40616"; Title: .H1="Legal Aspcts of Selected Office Services"; Author(s): Raymond R. Panko/RA3Y; Distribution: /LHD([ACTION]) MIKE([INFO-ONLY]) ; Sub-Collections: SRI-ARC; Clerk: RA3Y; .IGD=0; .SNF=HJRM; .RM=HJRM-7; .PN=-1; .YBS=1; .PES; Origin: < PANKO, IF.NLS;51, >, 3-JUN-77 16:18 RA3Y ;;;;.PN=0; .PES; .YBL=0; .YBS=2; .H1=" .Split; Page .GPN;"; .F="Legal Analysis .Split; Raymond R. Panko"; .LM=8; .RM=83;####;

.GCR=2;.Center=1;INTRODUCTION.GCR=1;.Grab=9;

This report identifies major legal problems that Bell Canada might face if it were to enter the U.S. market for "office of the future" (OOF) products.

To evaluate the legal aspects of the U.S. OOF market, Bell Canada must consider both regulation and private litigation. By regulation, we mean 1) actions of regulatory agencies or Congress, and and 2) complaints by existing companies to these regulatory entities. By private litigation, we mean suits waged by and against competitors.

Our analysis focuses on the near term, between 1980 and 1990. Since we must anticipate the future, our conclusions necessarily involve speculation. But while unexpected legal turns can always arise, it appears that most regulatory problems that may appear in the near term can be anticipated and gauged fairly well and that the largest long-term problems can at least be identified and gauged roughly.

We have examined only those regulatory problems that would cause major difficulties for Bell Canada in the U.S. OOF market. Accordingly, Bell Canada should not take this study as a full analysis of the OOF regulatory arena in the United States.

Bell Canada should understand that few new services are adequately anticipated in existing regulations. As a result, things may always come to court, and court decisions are often unpredictable. We have given our best assessment of how relevant regulations and political decisions will affect each service discussed in the text, and we have tried to indicate where the situation is fluid or uncertain. Yet some issues will not be completely decided until the service being discussed is already in the marketplace.

.GCR=2;.PBS;.Center=1;THE GENERAL REGULATORY ARENA.GCR=1;

Traditionally, electronic and postal communications have been regulated extensively in the United States, while data processing and word processing have been subject only to general commercial regulation, such as patent, antitrust, and improper business practices laws.

Between now and 1990, communication regulation should remain esentially as it is, apart from a general tendency toward greater competition. This statement should hold true even if Congress should rewrite the Communications Act of 1934 -- the Federal Communications Commission's charter -- as the House Communications Subcommittee is now considering doing. Unless the anticompetitive "Bell Bill" that is now before Congress passes virtually intact (and this is most unlikely), or unless the courts throw out the bulk of the FCC's procompetitive rules as improper infringements on state government powers (this is also unlikely), telecommunications regulation in 1990

should be much like telecommunications regulation today. Even the unlikely entry of the Post Office into electronic mail would not be cataclysmic, because it seems very unlikely that the USPS will be given a monopoly in electronic mail if it is allowed to enter this market at all. There is even an antitrust suit by the Justice Department to break up AT&T that could greatly stimulate competition; but it is unlikely to successed completely, and at most it will improve the competitive situation only slightly. The only anticompetitive force with any real chance of effectiveness is intrastate regulation by state public utilities commissions, and even this force is unlikely to have a major impact on most services.

The regulation of computing and office products will increase gradually, but regulation is virtually nonexistent today, and it will be slight even in 1990. Privacy laws will appear fairly quickly, and some regulation of standards may emerge, but these developments should not be onerous. Private litigation in the computer and office products market is almost nonexistent today and should not become a substantial problem in the forseeable future. In fact, most private litigation in the near term will be aimed at reducing the scope of IBM's potential competitive responses to new competitors, and this should help Bell Canada. While a current Justice Department suit is aimed at breaking up IBM, it is unlikely to produce more than a modest improvement in the competitive marketplace -- in which IBM's market share has been steadily declining for a number of years.
.GCR=1;ELECTRONIC COMMUNICATIONS.Grab=9;

Except when Congress intervenes, the FCC regulates all INTERSTATE communications services offered for hire. The FCC's charter is the Communications Act of 1934, as ammended. When major questions of policy arise, the FCC opens "dockets" for comments, conducts inquiries, and issues binding reports and orders. The courts have traditionally interpreted the Communications Act as giving the FCC broad authority and discretion in defining its scope of powers.

From time to time, Congress does influence the FCC, either by advice or by modifying the Communications Act of 1934. Congressional committees, aided by a study of the Congressional Office of Technology Assessment, are currently contemplating a complete rewrite of the Communications Act. This does not seem likely to take place in the very near future, however, and it should not cause major problems for Bell Canada except under unlikely scenarios. If anything, a new Communications Act should produce a more rational and healthy competitive environment.

The FCC has no jurisdiction over internal corporate telecommunications, although its regulation of for-hire services can somewhat affect tariffs and the availability of services. The internal corporate telecommunications market is quite attractive because of the absense of regulations.

INTRASTATE communications are outside the FCC's jurisdiction. State Public Utility Commissions (PUCs) normally regulate intrastate communications. Because there are 50 states and also a number of municipal regulators, intrastate communication can be fairly complex. PUCs generally give operating permits, set rates, control services, govern entry and exit, and tariff the subscriber equipment offered by carriers. There is some FCC influence in state matters, but this is limited. State and local regulation will be very important for some services.

During the last ten years, the Federal Communications Commission (FCC) has moved to increase competition in telecommunications. It has liberalized rules for the interconnection of noncarrier equipment to the telephone system, has allowed the sharing or resale of certain transmission services, has forced AT&T to provide less discriminatory tariffs, has mandated competition in domestic satellites and microwave transmission, and has established rules to prevent AT&T and other carriers from using their monopoly power to subsidize entry into data processing. This procompetitive stance is expected to continue throughout the forseeable future.

Although the FCC has primary jurisdiction over telecommunications, the Justice Department has historically been active in the limitation of monopoly power in the telecommunications industry. In 1913, and again in 1956, the Justice Department has sued AT&T and in both cases won substantial concessions in Consent Decrees. The Justice Department is currently engaged in another antitrust suit against AT&T. While the suit has some merits, it may take another five years to mature, and its net effect should be only a modest curtailment of AT&T's monopoly powers.

Except at the state level, the thrust of all major trends is for more competition. How long the trend will continue depends largely on whether state public utilities commissions win lawsuits to overthrow FCC rules requiring the interconnection of equipment to the telephone system. So far, the courts have upheld the FCC, and it is difficult to conceive of a major reversal in interconnection. However, the FCC's computer rules, which order that carriers may not offer data processing services, except through unregulated subsidiaries, have yet to be tested when intrastate carriers are affected. If state PUCs win a ruling that their carriers would be allowed to offer data processing services, Bell Canada could face much stiffer competition from AT&T, but such a ruling is unlikely, and even if it does occur, it would merely introduce one more (albeit large) competitor. It would not cast Bell Canada from the market. In addition, state PUCs are not adamantly against competition; rather they are torn between keeping residential rates low and the provision of new and innovative services to businesses. Some states, such as California and New York, are quite liberal. Farm states, on the other hand, are often rather anticompetitive.

.GCR=1;COMPUTER AND WORD PROCESSING REGULATION.Grab=9;

Today there is virtually no regulation of computers and word processing equipment, other than general trade laws. It is very difficult, in fact, for one who is used to working in the telecommunications industry to understand just how little regulation and private litigation realy do affect computers and word processing -- except when these industries begin to merge with telecommunications.

What little regulation does exist today comes in the privacy domain. The government already has regulations on its internal collection, storage, and use of private information. Similar regulations are likely to begin affecting data bank operators in the near future. Unless Bell Canada operates data banks, these regulations will not affect the company directly. However, if its products have inadequate privacy or security protection, it may be difficult to market products, and Bell Canada could conceivably be named as a co-defendent in lawsuits against data bank operators.

There is some movement, primarily among academicians, toward the

creation of comprehensive regulation for the "information industry." Following past regulatory history in the United States, such regulation is likely to come eventually, but it cannot come quickly. While the Congressional Office of Technology Assessment is currently conducting a preliminary study of the new information industry, this is a very small probe. Comprehensive information regulation probably cannot appear until after 1990, unless there are a series of major scandals in information abuse.

Most of the legal activity today consists of a major Justice Department antitrust suit against IBM. The Justice Department is seeking to break up the computer company. This litigation will certainly fail to achieve this goal, but it should serve to weaken IBM somewhat as a competitor, and to force more open business practices in the industry, Bell Canada will probably be helped by any outcome of the suit.

Several years ago, companies in the computer industry could use their extensive patent positions to strangle competitors. They could also hold back the publication of their equipment standards, in order to prevent competitors from offering peripheral equipment. But past suits against IBM and Xerox have sharply curtailed these practices, and there is now extensive cross-licensing of patents among computer and word processing companies, and there is (reasonably) open publication of IBM standards. As a result, patent and standards litigation is very small, in fact almost nonexistent. Bell Canada should do all right, provided it has patents to trade in cross-licensing agreements and is willing to engage in sometimes tedious negotiations.

Overall, neither regulation nor private litigation promise to be major problems for competitors in the computer and word processing markets -- until they approach the interface to the public transmission network, and thereby become possibly entwined in telecommunications regulations -- or unless they fail to develop strong patent positions or fail to design their products with adequate privacy and security protections. Sometime in the quite distant future, there may be comprehensive information industry regulation.

.GCR=1;GOVERNMENT PURCHASING REGULATIONS.Grab=9;

Most government contracts have "buy American" clauses that require government agencies to purchase American products in preference to foreign products, unless American companies do not produce the item, or unless there are significant cost savings (on the order of 5% to 15%). These rules change constantly, so it is difficult to be more specific about the actual make-up of "buy American" clauses. We anticipate that such clauses will remain in effect indefinitely. Even a U.S.-incorporated Bell Canada subsidiary would not be able to sell products easily under "buy American" restrictions.

.GCR=1;TAXATION.Grab=9;

The sale of hardware faces state taxation almost everywhere. But the taxation statuses of software sales, service bureaus, keypunching services and other aspects of novel computerized services are open to varying interpretations in most states. Particularly in the case of software sales, existing tax laws are extremely vague. Naturally, state governments are attempting to levy taxes whenever they can, so the vague state of existing law will inevitably cause problems. Until two or three years ago, problems were only latent,

but many states have recently dunned companies for back taxes, and practical problems are abounding.

In its business plan, Bell Canada should expect to face taxation on most of its services in the United States, in order to be financially conservative. This will avoid unexpected back taxes that could ruin a U.S. subsidiary's working capital balance. The real question is whether to bill customers for taxes. If Bell Canada does, it may set unwanted precedents. If it does not, it may have to make up back taxes from its profits. By the time Bell Canada actually enters the marketplace with products, some precedents should have been set, but taxation struggles should be expected to continue past 1985. Taxation could be an important factor in deciding where to put the central headquarters and computer centers for service bureau applications.

.GCR=2;.PBS;.Center=1;SERVICES CONSIDERED IN THIS STUDY.GCR=1;

We have considered several discrete OOF products and services in some detail. These services seem to identify the major legal problems Bell Canada would face if it were to enter the U.S. office of the future market.

RESALE AND VALUE-ADDED NETWORK SERVICES. New FCC rules allow companies to resell the interstate transmission services of monopoly carriers such as AT&T and Western Union. In the past, resalers had to demonstrate that they "added value" to the resold lines, but this is no longer necessary. Resalers, however, must still apply for common carrier status. They are subject to the whole mantle of common carrier regulation, except that they need not prove in their applications that there is a public need for their service. As noted below, resalers can probably offer an integrated comunication/data processing service. This will require individual FCC waivers of the computer rules, but such permission should be almost automatic. Among the existing resale carriers, two are packet-switched transmission networks (Telenet and TYMNET) and two are a record message carriers (Graphnet and TYMNET). Presumably, a Bell Canada resale network would be based around a packet-switched network but would offer other services, such as computer mail, word processing, and other services.

COMPUTER MAIL. Computer mail is reminiscent of Telex and TWX, but computer mail uses modern packet-switching and other transmission techniques to reduce costs, and it also offers many computer tools for the processing of messages before and after their transmission. A very simple system that merely tries to replace Telex or TWX as cheaply as possible can send domestic messages (in the U.S.) for about 25 cents apiece, including the typist's time. More advanced computer mail systems provide many processing tools, in an effort to reduce the 30% of all labor hours that a typical corporation spend processing paperwork. Advanced systems are now as expensive as Telex or TWX, and some are considerably more expensive, but their costs are falling very rapidly. Even fairly advanced systems should be cheaper than postage by 1985. Perhaps most importantly, computer mail is evolving into a general office processing tool; they are expanding in two main directions: first into data communications and data processing, and second into word processing and administrative support.

SUPER PABXs (INCLUDING LANDLORD PABXs). The PABX (private automatic branch exchange) is a telephone switching center that is located on a user's premises and may be owned and operated by the

user. Newer PABX's are computerized. It might be possible to use the PABX's computer to create a general OOF service, including telephone switching, data communications, word processing, administrative support, data base management, and so forth. For want of a better name, we will call PABXs that offer these expanded services "super PABXs." Some super PABXs may be so large that they can only be purchased by building landlords, who would lease use of the super PABX to residents of the building.

WORD PROCESSING. Word processing is the automation of text preparation, including initial composition, text editing, and related operations. Since in 1964, when IBM introduced the MTST, word processing has grown rapidly, although primarily in environments characterized by repetitive typing. Since most word processing systems are expanding into general integrated office of the future (OOF) systems, we do not consider word processing by itself.

GENERAL OFFICE OF THE FUTURE (OOF) SYSTEMS. A general OOF system is one that uses centralized or distributed intelligence to provide a broad spectrum of users within an organization with a broad spectrum of tools for use in their daily work. Some typical services that would be offered include word processing, administrative support, management information systems, forms processing, computer mail, data base management, and personal information spaces. While there is no truly general OOF system in the marketplace now, the creation of increasingly more general office processing systems is certainly the dominant design trend today.

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INTERSTATE NETWORK SERVICES

Four companies have so far applied for and received permission from the FCC to resell common carrier transmission services. Each of these services preportedly adds value to the transmission service. Three of them -- PCI, Telenet, and TYMNET -- offered or were prepared to offer packet-switched data transmission and ancillary services such as error correction and optimized routing. Two of them -- Graphnet and TYMNET -- are tariffed to offer record communication services reminiscent of those of Western Union's services. These four were called value added networks, or VANS, when they were first tariffed, because they presumably added value to the transmission service received by users.

When the four services were tariffed, one had to prove value addition in order to resell transmission services of common carriers. But the FCC has recently struck down shared-use and resale prohibitions for interstate transmission tariffs, at least for private wire services. Under the new rules, a company can apply to become a resale common carrier and resell transmission services without the basic common carrier's interference. This has greatly expanded the potential market for the resale of common carrier services. However, several points should be noted. First, resale of wide area telephone service (WATS) and direct-dialed toll service are not allowed. Second, both AT&T and Western Union have withdrawn their bulk Telpack offerings, so resale is effectively limited to normal private-line services and the services of the specialized common carriers, such as MCI and Southern Pacific. Another important point is that resalers will be subject to all common carrier regulation, apart from the need to show a public need for new services in their tariff applications.

Yet the resale decision is extremely important for Bell Canada.

Because Bell Canada is a foreign company, it is forbidden to hold radio licenses -- including microwave licenses. Thus, Bell Canada could not be a traditional common carrier owning microwave lines (it can, however own cable or wire). The same prohibition would hold against any company that Bell Canada invested in, if that company is more than 20% foreign-owned. Section 310(a) of the Communications Act of 1934 gives details on the restrictions on foreign ownership or influence. We quote part of that section:.YBL=0;

.Center=1;LIMITATION ON HOLDING AND TRANSFER OF LICENSES

Sec. 310. (a) The station license required hereby shall not be granted to or held by --

(1) Any alien or the representative of any alien;

(2) Any foreign government or the representative thereof;

(3) Any corporation of which any officer or director is an alien or of which more than one-fifth of the capital stock is owned of record or voted by aliens or their representatives or by a foreign government or representative thereof or by any corporation organized under the laws of a foreign country;

Any corporation directly or indirectly controlled by any other corporation of which any officer or more than one-fourth of the directors are aliens, or of which more than one-fourth of the capital stock is owned of record or voted after June 1, 1935, by aliens, their representative, or by any foreign government or representative thereof, or by any corporation organized under the laws of a foreign country, if the Commission finds that the public interest will be served by the refusal or revocation of such license. ....YBL=0;

However, nothing in the Communications Act forbids Bell Canada from being, owning, or investing in a resale carrier, if that carrier owns no lines or owns only wire lines. While there is also a prohibition in Section 222 (d) against mergers of telegraph operations that would result in substantial foreign ownership and influence, we can think of no conditions under which this prohibition could apply.

Second, and most critically, the resale decision is important because resale carriers may apply for waivers from the FCC's "computer rules" (in Section 64.702 of the FCC Rules and Regulations) that prohibit carriers from offering data processing services, except through an arms-length subsidiary. So if a waiver could be obtained, a Bell Canada resale carrier could offer integrated data processing and communication services. Our discussions with the FCC indicate that waivers will be granted almost automatically if the company is not a monopoly carrier in the United States.

This waiver provision is crucial, because it will allow a Bell Canada resale carrier to provide a full spectrum of OOF services, both communications and noncommunications services. It seems very unlikely that a resale carrier will be forced to tariff its noncommunication services.

Third, because AT&T may only offer regulated communication services, thanks to a 1956 Consent Decree that AT&T signed with the Justice Department, one potential competitor in the integrated OOF market is forbidden from offering integrated communication and data processing services. Nothing in the current rules, proposed rules, or Consent Decree would prevent AT&T from creating a packet-switched network, however, and indeed AT&T is known to be designing one. However, this will be a transmission network and could be hamstrung

in competition with an integrated transmission and data processing network.

An important consequence of a Bell Canada resale network is that such a network might form the architectural "glue" needed to hold Bell Canada's full range of office products together.

For completeness, we should note that the FCC did not specifically allow resaling. Rather, it struck down as unreasonably discriminatory those provisions in interstate tariffs that prohibited the sharing or resale of private-line services. In other words, interstate carriers had traditionally prohibited resale and sharing. The FCC merely told them that they must stop that practice.

.GCR=1;INTRASTATE NETWORK SERVICES.Grab=9;

Our proceeding discussion has dealt only with INTERSTATE communications. The FCC has no jurisdiction over INTRASTATE communications, so its prohibition against antiresale provisions in interstate tariffs does not extend to intrastate tariffs. So if a resaler wishes to handle transmission between points in a single state, this could still be forbidden if there are antiresale provisions in that states's carriers' tariffs. Our brief survey of a few states indicates that antiresale provisions are, in fact, standard.

So far, Telenet and TYMNET -- both resale carriers -- have applied only for interstate tariffs, despite the fact that each network has more than one node in several states and may be used for intrastate communications. However, no state regulatory body has challanged these networks, so no real regulatory precedent has been set.

We must assume that future resale carriers will have many nodes in large states, and that their revenues would be substantial. Under these conditions, their relationships with state PUCs will have to be clarified. We suspect that waivers to intrastate antiresale provisions will be needed -- although there is some chance that the FCC will preempt the entire resale area. We suspect that most state PUCs will be willing to authorize resale, provided they see a value in these services to state businesses, and provided that revenues are not diverted too severely from the traditional regulated common carriers in that state.

We note, for competeness, that an interstate resale network will have to be connected to the local intrastate network, so that customers may access the network from another part of town or from another city. The FCC has already ordered that "other common carriers" can interconnect to the intrastate system, and this order was not contested. Although resale carriers did not exist at the time this manadatory interconnection rule was laid down, it is generally agreed that they will apply to resale carriers, since Telenet (a resale carrier) now purchases private wire and WATS service for its customers.

Overall, resale status is extremely attractive to Bell Canada. It will allow Bell Canada to compete in the United States with an integrated communication and data processing services, at least at the interstate level, and probably at the intrastate level as well.

.PBS;.GCR=2;.Center=1;COMPUTER MAIL.GCR=1;

Most word processing and data base systems are beginning to expand into message transmission. Computer mail goes the other way, beginning with communications and expanding, potentially without limit, into integrated OOF service.

Computer mail (CM) begins as an expanded Telex or TWX service, adding computerized composition, editing, filing, and reading tools. We call this Level-I CM. The next level of CM systems (Level-II systems) automate the entire life cycle of a message, paying for their higher costs out of labor savings. Some Level II CMs also automate the processing of forms, which make up about 80% of all message transmissions in typical cases. Both Level I and Level II systems can be sold as distinct services, and both would probably compete effectively for the $1 to $2 billion message communication market.

Even higher levels of computer mail use message transmission as the glue to build a general office information system. Forms processing tools expand into data base management systems for accounting, marketing, management information, and administrative support. Narrative message processing tools expand to embrace facsimile and even voice.

If Bell Canada only sells computer mail hardware, it will have no regulatory problems. Nor would there be problems if a customer builds an internal corporate network from Bell Canada CM components or if Bell Canada itself engineers the internal corporate network. Because internal corporate systems will create the largest part of the CM market, Bell Canada will have its major CM market segment free of regulation.

This is a very important point. Although we spend the remainder of this section discussing problems that arise when CM is offered as a for-hire service, rather than as a hardware/software system, we will be discussion only INTERCOMPANY communication, which will carry only perhaps 15% to 30% of all messages in the total message economy

Level-I systems fall into the grey area between computers and communications. The FCC is required to regulate ALL for-hire interstate communication systems. At the same time, the FCC is forbidden to regulate ANY data processing systems. We suspect that very simple Level-I CMs will have to be offered by commmon carriers.

Level-II and more extensive systems, in which the transmission of messages from writer to reader should generate only about 10% of total revenues, will probably be exempt from common carrier regulation, although this is only a guess, and precisely where the FCC will draw the line between regulated and nonregulated CM is arguable.

To span the market, Bell Canada will probably wish to offer several levels of computer mail service. It probably will also wish to offer simple message-switched transmission, to interconnect higher level CMs used predominantly for intracompany communications. This will require Bell Canada to be both a regulated common carrier, an unregulated data processing company, and an unregulated equipment vendor. As noted in the preceeding section, this will require Bell Canada to be a resale carrier.

Intrastate communications could be tricky. If the computer mail resaler handles any intrastate communications, it may come under the aegis of the state Public Utilities Commission. The potential problems in intrastate resale were discussed in the preceeding section. Since the FCC has traditionally been the sole regulator of the telegraph carriers, however, computer mail may stand a better chance of avoiding state regulation than resale in general. In addition, even if customers were required to purchase their own intrastate communication lines, this would not kill a computer mail

service, since transmission per se will cost less than 2 cents per message, out of a total cost that may exceed 25 cents per message. It might not be fatal to require intrastate communications to go by alternative means. Still, an integrated intrastate/interstate service would be much more attractive.

Overall, in the primary computer mail market, the sale of systems to individual corporations for internal use, will be totally unregulated. But a network service company, which would supplement the basic internal corporate service, would have to become a regulated resale common carrier and request a waiver from the FCC to offer data processing services. Intrastate transmission for the networked service will be difficult in some states, but these difficulties should not be fatal.

.PBS;.GCR=2;.Center=1;SUPER PABXs (INCLUDING LANDLORD PABXs).GCR=1;

Modern PABXs are often computerized. Presumably, their computer power could be used to provide other services besides voice switching. A moderate extension would provide integrated voice and data switching. More radical extensions would add word processing or even (perhaps) general office automation system tools. We call all extended PABXs, generically, "super PABXs."

Super PABXs can either be sold to telephone operating companies, for resale to users, or they may be sold directly to users. The first option, sale to telephone companies, is not attractive. First, AT&T controls over 80% of all telephones and purchases all such equipment from Western Electric. Second, while sale agreements with non-AT&T operating companies can and in many cases should be obtained, it would be nice to compete everywhere without the need to negotiate agreements.

The sale of super PABXs directly to users would provide a larger marketplace. Moreover, this marketplace may be immune from competiton from AT&T. Under the 1956 Consent Decree, AT&T may own only regulated communication companies; yet the FCC's "computer rules" require that carriers establish an arms-length subsidiary for all data-processing services. Together, these two rules preclude AT&T from the super PABX market. While there is some chance that the FCC might reverse its rules or that the Consent Decree might be lifted, these eventualities seem unlikely, and all they could do is reallow AT&T to enter the marketplace. There is a slightly larger chance that states will be able to throw out the arms-length subsidiary rule; since PABXs are sold at the state level, this would put AT&T squarely in the game. But the odds of state dominance are low, and AT&T would probably be sued by the Justice Department if it offered a blatant PABX. In general, it seems most likely that AT&T -- the largest supplier of PABXs -- will be kept out of the super PABX market.

The next question is, "Are there any regulations that would prevent Bell Canada from selling super PABXs to companies directly?" The answer is, "Yes, but these restrictions are light and are expected to vanish entirely very soon." Prior to 1968, the U.S. telephone carriers prohibited the interconnection of any noncarrier equipment to the telephone system. In 1968, such prohibitions were declared unlawful, but the carriers still harassed interconnect suppliers by requiring users to rent expensive "protective modules" to be placed between the foreign attachment and the telephone system. The FCC has recently struck down requirements for protective modules, although it has required noncarrier equipment to be certified for

safety. At present, the courts are still considering whether the FCC's relaxed interconnection rules are lawful in the case of PABXs, but it is expected to uphold the rules completely in the year. That decision will effectively end interconnection problems for super PABXs.

Even if the court decision, by some fluke, turns against the FCC's interconnection rules, the requirement to purchase a protective module would not kill super PABXs economically. Furthermore, several states, including California and New York, have already initiated their own registration program to eliminate the protective module.

The FCC does not regulate the sale of intrastate services, such as the sale of PABXs, and the state public utilities commissions do not regulate noncarriers, so the interconnection rules effectively remove from all regulatory jurisdiction the sale of Bell Canada super PABXs directly to customers. While there is some possibility that state PUCs will successfully overturn the interconnection rules in the courts, and so bring Bell Canada under the regulatory umbrella, the chances of this are extremely remote.

Overall, super PABXs will probably face no regulation at all, while carriers -- especially AT&T -- will be hobbled by regulation. So in the competitive environment, noncarriers like Bell Canada's super PABX subsidiary can expect a free and open marketplace.

The landlord PABX case presents unique problems, because it is unprecedented in telecommunications. In electric power, landlords who buy power in bulk and resell it to their tenants must be regulated. Furthermore, several states require hotels to be regulated when they resell service. In addition, most state tariffs require that service may only be for the customer. Yet it is likely that state PUCs will allow landlord PABXs if there are real benefits to the building users and if not too much money is diverted from telephone revenues. Problems will probably appear only if landlords require use of the PABX from all renters and gouge the renters for service. This would certainly bring regulation, although there may be a loophole allowing nonregulation if service is sold at transmission cost plus PABX depreciation.

.PBS;.GCR=2;.Center=1;WORD PROCESSING AND GENERAL OOF COMPUTER SERVICES.GCR=1;

The general OOF market, including word processing (WP), management information systems (MIS), administrative support systems (AS) and other office-related services, is potentially many times larger than the telephone market. While businesses typically spend only 0.5% to 1.5% of their revenues on telephone service, they already spend more on computers. Yet computers have barely begun to crack the paperwork process, which accounts for 30% of all labor hours in a typical corporation.

.GCR=1;HISTORICAL REGULATORY PATTERNS.Grab=9;

Historically, office computer services in the United States have been entirely exempt from direct regulation. There is not even a technical standards setting agency with regulatory powers. Only general commercial laws apply.

Because this fact of nonregulation is so simple that it can be said in one paragraph, it could be missed among the report's long discussion of communication law. Yet it is critically important to any understanding of regulatory impacts on Bell Canada. It says just how open this marketplace really is.

Even in the area of private litigation (companies suing one

another), there are remarkably few problems. Anticompetitive practices that have involved the use of patents and standards to force out competition have been stemmed by court decisions, and today there is extensive cross-licensing of patents among computer and word processing companies, and the largest companies, such as IBM, now publish their equipment standards reasonably long before release. The companies we talked to reported almost no litigation, and their only significant worries were minor nuisance suits and the tediums of cross-licensing. Unless this pattern changes remarkably, and it now seems unlikely that it will, Bell Canada will suffer few problems of private litigation if it works to build up a portfolio of patents with which to trade.

.GCR=1;THE LONG-TERM REGULATORY OUTLOOK.Grab=9;

There is a growing sentiment, among some academicians, that the government should regulate the emerging "information industry," with comprehensive FCC-like regulation.

But this sentiment is not wide-spread, even among academicians. Historically, regulation has come primarily when there were major problems in an industry, and this is certainly not the case today. The information industry has traditionally been highly competitive. While public sentiment could change fairly rapidly, the soonest comprehensive regulation can possibly occur is ten years, unless there are several major information misuse scandals.

The only current activities in this direction are 1) a proposed re-writing of the Communication Act of 1934, which governs the FCC, and 2) a preliminary study of general telecommunications and information policy by the Congressional Office of Technology Assessment. Representative Van Deerlin, chairman of the House Communications Subcommittee, is concerned that the existing act may be obsolete because of the presence of hybrid computer-communication subsystem. A new act, which could possibly appear in three to ten years, could extend FCC control to embrace more information services. But the current intent of Congress, while still unclear, seems to lie in the directions of reducing the scope of regulation and of increasing competition. Although the Senate is very concerned with with rural telecommunications, this concern should not dominate the general sense of Congress.

Overall, Bell Canada should not be concerned with the emergence of general information industry regulation. Such regulation seems unlikely, will not occur soon in any case, and may not be onerous if it does come eventually.

.GCR=1;FOREIGN OWNERSHIP.Grab=9;

As there are no general computer regulations in the United States, Bell's foreign status in the Unites States will cause no general problems in the OOF market.

The only substantial potential problem would be "buy American" provisions in government contracts. At worst, this could close out the government market, perhaps 20% of the total. If a U.S. subsidiary were the selling company, buy American problems would generally remain.

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In the area of equipment sales to customers, A Bell Canada OOF subsidiary should find itself virtually free of regulation and even private litigation. This will hold true whether the OOF equipment or system provided is used for word processing, office automation, the telephone interconnect market. It even seems likely that AT&T will

be kept out of the market entirely (including the market for super PABXs); but there is a small chance that AT&T will be able to circumvent current regulations and enter those segments of the OOF market that involve telecommunications. Bell Canada should develop a good patent position so that it will be in a favorable position to negotiate cross-licenses. On a negative note, there is a good chance that even a U.S. subsidiary will have a difficult time selling equipment to the government.

Bell Canada should have little trouble offering an integrated communication and data processing OOF service as an interstate resale common carrier. Although a Bell subsidiary would be forbidden by law to own microwave links, it could be a resale carrier and could even own wire communication lines. If Bell Canada's resale network expanded to intrastate service, it would probably come under the purview of the state PUC's, and it is unclear whether these PUCs would allow expansion of the resaler into intrastate service in all 50 states. However, in any case, an interstate Bell Canada resale carrier would be able to purchase intrastate lines to connect it to its customers.

In the area of computer mail, Bell Canada may want to offer this service through its interstate resaler, or it may offer it through another entity. For interstate computer mail, simple computer mail systems will probably have to be offered by a common carrier, while more powerful systems would probably be exempt from regulation. The computer mail subsidiary should probably be a resale common carrier, so that it can offer a whole family of computer mail services. For intrastate computer mail, there is a good chance that this will be outside state control. If states do obtain jurisdiction, they might prohibit service by the Bell Canada subsidiary, although whether or not they would allow it in any given state is probably a toss-up. But even if they did disallow intrastate computer mail, customers' terminals could be designed to communicate via intrastate lines controlled by the customer, and this would not raise total costs seriously. It is important to remember that something like 80% of the market for computer mail will be in the area of INTRACOMPANY systems, which will be totally unregulated. The real purpose of the interstate and intrastate resale computer mail service would be to link intracompany systems and to allow potential users to sample the system.

PABXs may become so large that landlords of office building will wish to offer them for their customers. There are several weak precedents for the regulation of such a service, but none are decisive. If managers of buldings begin reselling telecommunications service for more than the cost of the telephone tariff plus PABX depreciation, they will probably be regulated by state public utilities commissions, although this regulation may not be onerous.

Overall, recent FCC rule makings have greatly extended competition in telecommunications. While Congress shows some signs of wanting to slow this trend, there are also opposing sentiments in Congress. Our best estimate is that competition in 1990 will look very much like competition today.

Intrastate services face uncertainties, because the power and leanings of state public utilities commissions are uncertain. We cannot anticipate how the 50 state PUCs will act in any given instance, but we do note that there are forces both to increase intrastate competition and to restrict it. Several states, such as

California and New York, are generally progressive, while many farm states resist weakening the traditional telephone carriers.

Equipment sales, all information services, and integrated interstate communication/information services should find no real problems. Although Congress is beginning to examine the general area of information regulation, nothing should come of this for at least a decade, except for privacy regulations. While this could change if major scandals appeared, it seems that the bulk of all OOF services will be able to function without regulatory interference.

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Transfer of RADC Architect Role to Ed Kennedy

This note is to officially inform everyone in the KWAC & RADC-NLS communities, that I will no longer be the contractual focal point or arcnitect at RADC. As I indicated at the last KWAC meeting, the presures have been building at RADC to get me out of the "NLS business" for some time and into areas that local management considers higher priority. It was formalized last week. 1

The new architect at RADC is Ed Kennedy. He is an active user of NLS and has done much at RADC to further its cause. Questions of an architectural nature should be addressed to him... KENNEDY@OFFICE-1, Ident = EJK for Journal users. Ed should be included in the AID Ident group. 1a

Contractual and adminstratitive questions should be addressed to Rich Calicchia, CALICCHIA@OFFICE-1, Ident = RC3. Rich has not been an active networking person, but is getting OJT. To cover yourself on messages concerning contractual matters, you should probably also copy KENNEDY for the next few weeks. 1b

My apologies for any trouble that the change over has caused in the past couple of months. I know in the case of DARCOM, NSRDC & NSF I have not been as responsive as everyone (including myself) would have liked. I hope you will all understand and forgive. 1b1

The past few years have been the most interesting and personally rewarding in my career. I consider NLS and more importantly, the people that surround it, to be the best in the business. I reluctantly give up my role of active involvement with NLS, but will of course be an active user/proponent/fan. I'm still looking forward to seeing the architect community in Oct at RADC for the semi-annual get together. 2

Stoney 2a

< GJOURNAL, 40805.NLS.1, >, 21-Jun-77 17:32 XXX ;;;; .HJOURNAL="JHB 21-Jun-77 17:02 40805"; Title: .H1="AREAS AND FUNCTIONAL ROLES FOR NEW BUSINESS"; Author(s): James H. Bair/JHB; Distribution: /DSM([ACTION]) NINA([ACTION]) JMB([ACTION]) RLL([ACTION]) KEV([ACTION]) SRI-ARC([INFO-ONLY]) ; Sub-Collections: NIC SRI-ARC; Clerk: JHB; .IGD=0; .SNF=HJRM; .RM=HJRM-7; .PN=-1; .YBS=1; .PES;

.PEL; .PN=PN-1; .GCR;This is humbly submitted for consideration by the staff roles committee, but may be of interest to the market committee as well. (In looking over the roles--functions as defined today (Tuesday afternoon) I don't see all of these areas covered.)

AREAS AND FUNCTIONAL ROLES FOR NEW BUSINESS

This is a brief statement of some areas that should be a part of the proposed business ventures currently underway.

ASSESSMENT and CONSULTATION.YBS=1;

There are at least three analysis roles that are appropriate to the office automation--information systems business: analysis of (1) needs--requirements, (2) impact upon productivity, (3) and design. The first two have high business value, the third is longer range, basic research..PlexNum=101;

Analysis of needs/requirements--systems analysis for OIS (pre-implementation)

This is a valuable source of business, and should be independant of NLS. Results could recommend NLS if appropriate, thus serving as a good way to select customers. Anyone interested of office automation could avail themselves of this service, however, making it much more generally appealing to uncertain potential customers. It includes:

Description of work processes and flow within the organization

Description of the technology that would increase the effectiveness of the work processes, information flow, decision making, management, etc.

Recmmendations for organizational change for innovation transfer and effective utilization of technology

Initiate the implementation of the appropriate technology based upon the needs/requirement analysis.

Analysis of Impact: qualitative and quantitative factors that affect productivity

A frequent question of potential and present customers is, "how will this improve my productivity?" If we do not have an answer, we can come out short. Thus, a needed function is to have the capability/service to demonstrate changes in productivity for customers. This includes the study of:

Changes in operating costs: decreased resources for increased throughput, increased responsiveness, better goal attainment

Changes in communication patterns, information flow, and work processes

Attitude, organizational climate, and morale

Relative quality of products (organizational output)

Analysis of Design: the interface and software that directly affect users

This research function could bring in additional contract money at some time in the future. This includes the study

of:
Design of application subsystems and procedures
Design of the interactive interface to minimize stress and maximize communication
Alternative human-computer communication media
System customization and adaptation, particularly for novice users

MARKETING

Marketing includes a number of steps:
- market analysis, helping to define the market sector and the refinement of the product based on the market analysis,
- helping to prepare marketing descriptions of the product/service,
- making contacts assessed to be high potential within the sector,
- recording contacts,
- follwing-up on contacts by arranging demos, presentations, seminars, etc.,
- making sales agreements, coordinating with concerned staff,
- and providing feedback to product development to improve sales potential.

There are two areas: marketing a service product and/or marketing an assessment--evaluation capability.

Marketing an assessment capability is very similar to marketing a product when in the business marketplace. The activity I perceive is more a consulting activitiy than a research effort, aiding large institutions in the acquisition and utilization of information technology. It requires that the group become known in the area through publications and word-of-mouth. AS with the product, a couple of big contracts can firmly establish a person in the field

Strategy:

The resources for a fledgling company or lab attempting to move a technology and service from the R & D stage into the commercial marketplace should be allocated to marketing at 15 to 20% of total effort. Personpower would be on the order of 5 - 7 persons with the AKW business of about 35 people, or 1-2 persons with the Man-Machine Office Automation Lab. That number doesn't seem practical, but it is probably still below the percentage for IBM. However, resources can be optimized by part time marketing help particularly where the individual has an extensive number of contacts. Several persons at 1/4 to 1/2 time would probably be more effective than the equivalent full time staff.

Facilities need to be provided to speak the non-verbal language of the marketplace. If that is R & D exploratory, then environments like that at ARC probably will suffice. In the business world appearances do count, and the facilities and people must look successful and sharp, in my opinion (IBM does do it).

APPLICATION DEVELOPMENT AND INNOVATION TRANSFER

The design and development of courseware, user documentation, user subsystems, and applications is of course a vital area. The maintanence of documentation, etc., should be performed by a service group. The design of subsystems, documentation, etc., should be performed by a group with special expertise in the area.

Enabling applications persons to design user subsystems would be an advantage in the client community (Tymshare's service reps are usually application programmers or have programming support). Courseware should be designed (or refined) by instructors in cooperation with persons who have special expertise in the area. The specification and detailed planning of system implementation is a vital activity that differs from systems analysis. It does not have a report as the outcome and focuses primarily upon the coordination and building of an application. This is referred to as the "client coordinator role", which has been well defined by the Application Services Group.